APRIL 3, 1961

PAPER TRADE JOURNAL

French Cold Soda Mill . . .
makes top grade newsprint pulp from "match sticks" chipped and baled in-the-woods. Exclusive report from European editor.

Increased Wire Life . . .
and machine efficiency related to the condition of fourdrinier components. How to take care of them when running and when down

Contents of the Week, pages 4-5

Celebrating 75 Years of Service to the World's Pulp and Paper Industry

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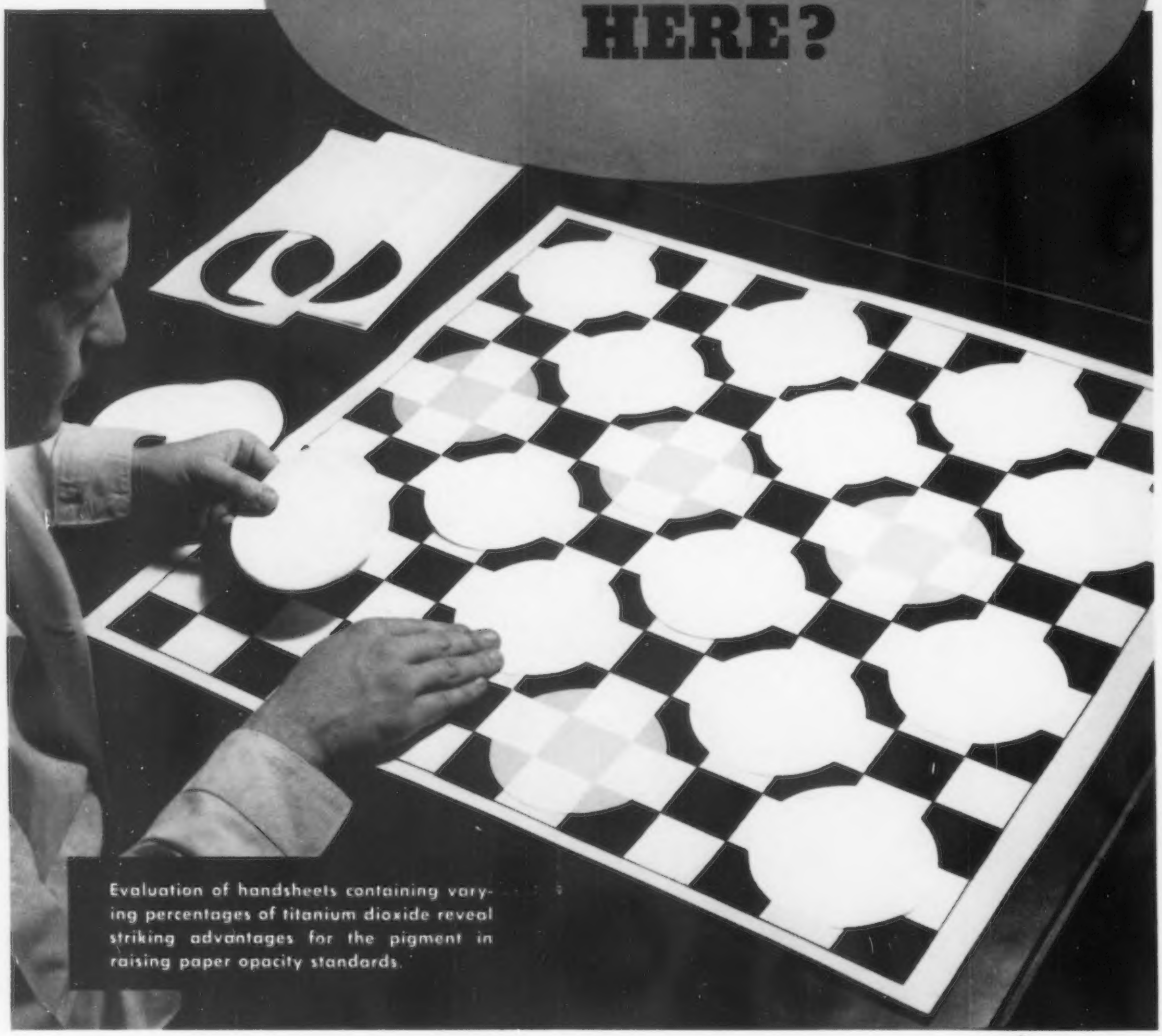

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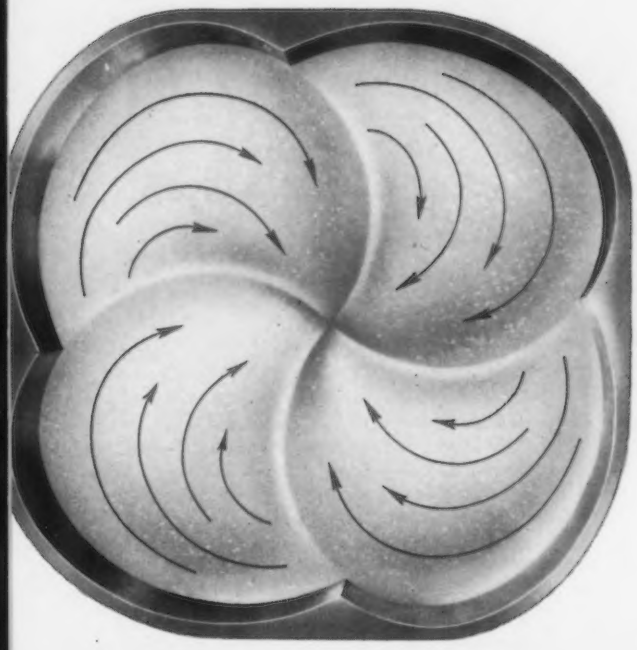
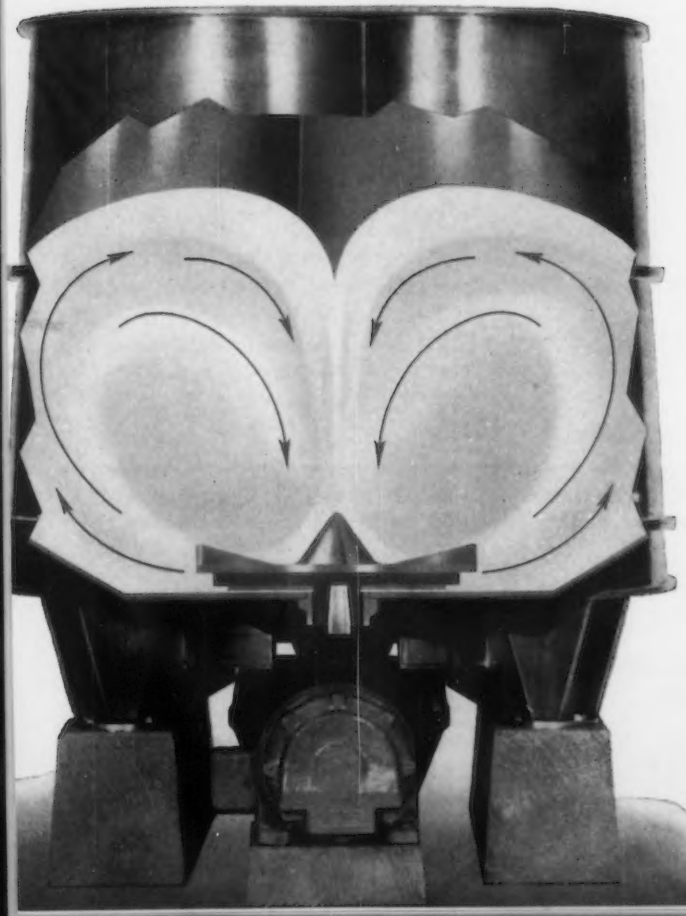
8 BIG REASONS why mills choose the EMERSON TRIPLE ATTACK PULPER





1 FAST, UNIFORM DEFIBERING
Triple Attack pulping results from the (1) violent action of the impellor, which (2) forces stock against the lobe-shaped, tapered tub wall, which redirects it (3) against more onrushing stock coming from the impellor. No dead spots exist as fibers go through repeated cycles of contact with the impellor, tub wall and other fibers.

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Emerson Triple Attack Pulpers are available in 9 sizes — from the 100 lb. laboratory or low tonnage model to the 8000 lb. unit — in carbon steel, several grades of stainless steel and tile. Complete information will be provided by getting in touch with our sales engineer nearest you or The Emerson Manufacturing Co., Division of John W. Bolton & Sons, Inc., Lawrence, Massachusetts.

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Week of April 3, 1961
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FEATURED THIS WEEK

French Cold Soda Plant Produces Superior Pulp for Newsprint Furnish

This exclusive article describes highly significant facets to La Chapelle's—continuous cold soda pilot plant—chipping and chip baling at the logging site—stone ring fiberizer—chip slurry pump—Ernest F. Barker **30**

Fourdrinier Maintenance—Key to Machine Efficiency and Wire Life

How are these objectives affected by the condition of the fourdrinier's components? Here are some of the answers. What should be done about them: when the machine is running? when the machine is down?—J. E. Vercoe **36**

Less Wire Wear-Teflon Suction Box Covers

Substantial advantages have been reported. Of importance is the method of bonding Teflon to substrate—Robert L. Holmes **41**

What are the Vital Factors in Tissue Felt Operation and Life?

Felt application to tissue manufacturing and problems met were explored at Albany Felt Co. Round Table. **42**

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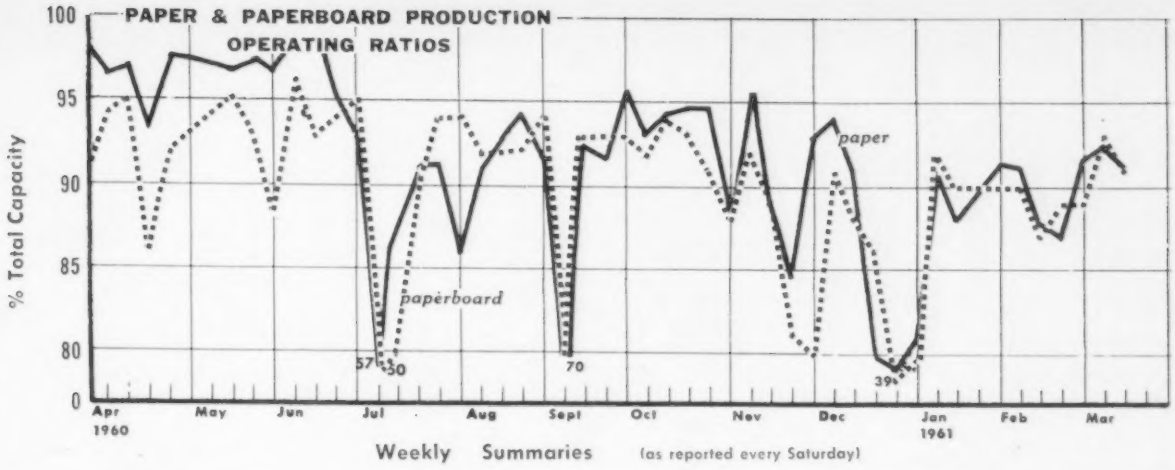

NEWS OF THE WEEK

K-C Completes First Project in Expansion Program . . . Scott Starts up New Machine for Lightweight Paper . . . Brown Announces Major Expansion . . . Sorg Reorganizes Two New Companies . . . Champion Shareholders Vote To Acquire Carpenter Paper . . . . . **Trends** *15*

Popovich Joins Westfield As Technical Director . . . Pollard Advances At Great Northern . . . Langley Joins Howard Smith at Cornwall . . . Kimberly-Clark Names Appert Vice President . . . Byron Weston Elects Fahey President . . . . . **News of the Industry** *19*

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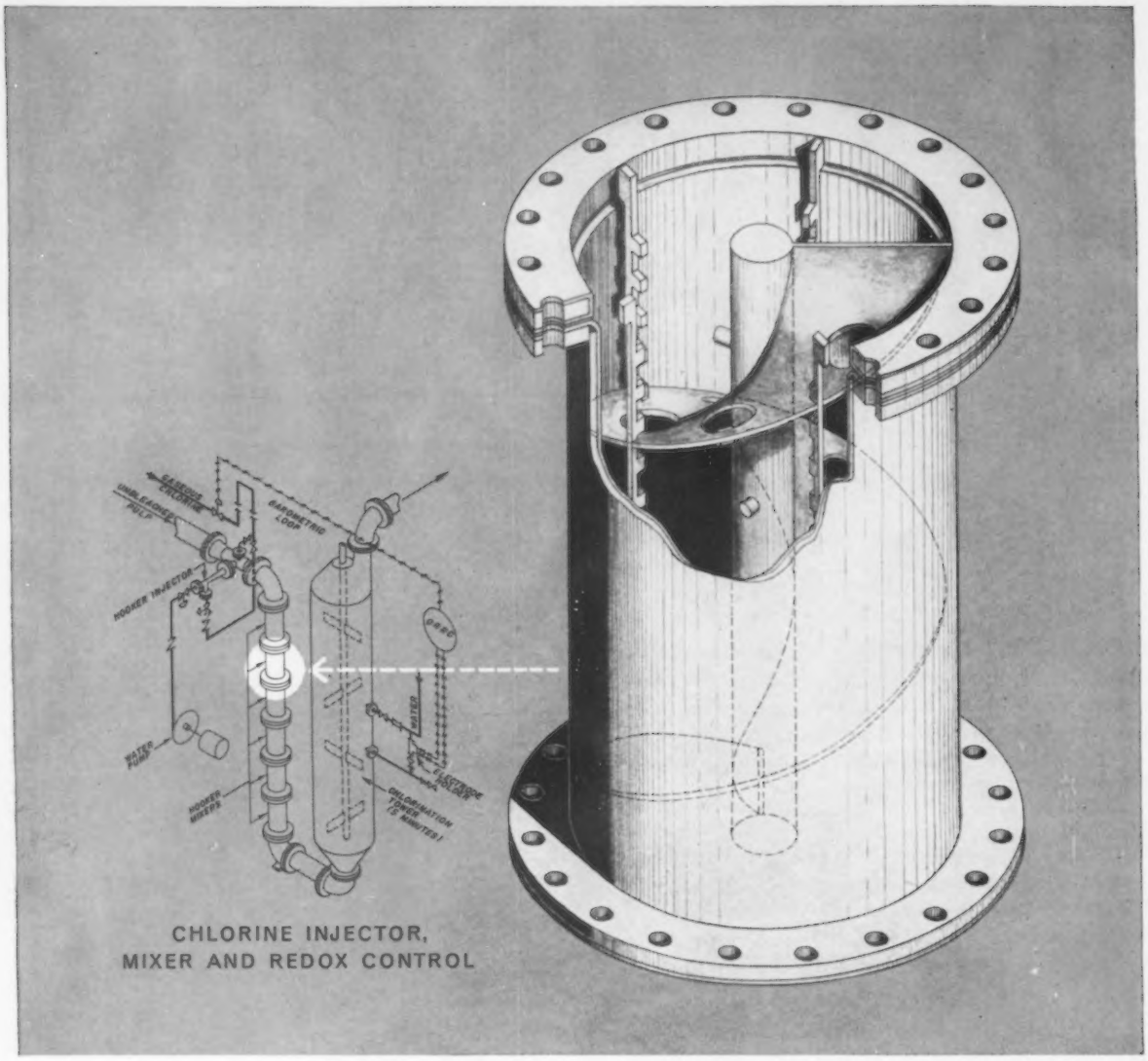
REMEMBER THESE DATES

Technical Ass'n of the Pulp and Paper Industry, 12th Annual Coating Conference, Statler-Hilton, Buffalo, N. Y.	MAY 8-10
Paper Industry Management Ass'n National Meeting, Robert Meyer Hotel, Jacksonville, Fla.	JUNE 7-9



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MIXER AND REDOX CONTROL

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Now, a different kind of chlorine-pulp mixer—developed with typical Hooker chemagination—puts an end to the guesswork in pulp-chlorine mixing.

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Successful control of chlorine addition by redox potential requires thorough chlorine-pulp mixing. Hooker mixing in combination with Hooker chlorine injection, redox control, and retention-time control adds even more to increased profits.

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ANOTHER ACHIEVEMENT IN MODERN FLOW CONTROL BY CRANE

CRANE 125-AND 150-POUND UNION BONNET BRONZE GATE VALVES

STRONGER CYLINDRICAL BODY DESIGN FOR LONG SERVICE LIFE

Every part of these new valves has been carefully engineered and liberally proportioned to assure an extra safety factor over the recommended working pressures. Unlike ordinary pinched-in, rectangular body valves, Crane's cylindrical body—the same design used in Crane's heavy-duty 200- and 300-pound bronze gate valves—distributes pressure loads uniformly and reinforces seat against the wedging action of the disc.

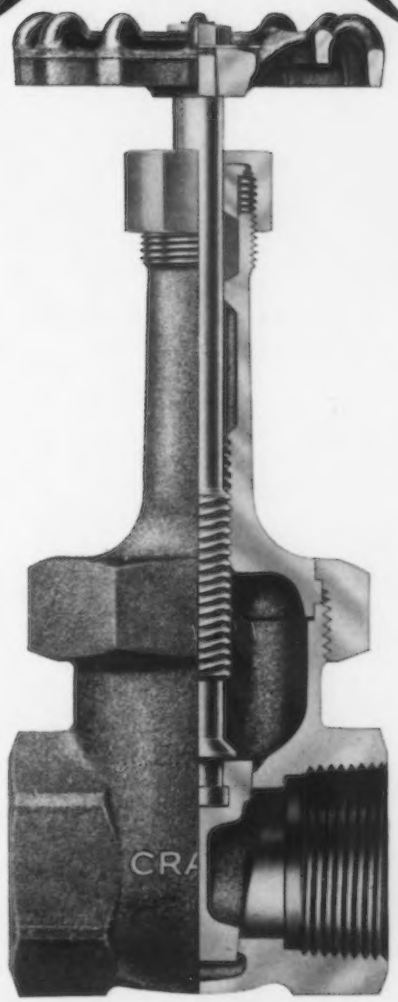
Wider, huskier hex ends combined with the new body shape give this valve greater rigidity, reduce chance of leakage and early failure resulting from piping strains. They make for easy installation, too.

Many other Crane features—the deep stuffing box that can be repacked under pressure, substantial thread engagement between stem and bonnet, and a precisely fitted bonnet joint—make this valve a best buy for safe, dependable, long service on steam, oil, gas and water lines.

Crane's 125- and 150-pound Union Bonnet Bronze Gate Valves are made in ¼-inch to 2-inch sizes with either a solid or split wedge disc. Both disc types are carefully machined and fully guided for positive, easy operation.

Your Crane Distributor has these new valves in stock. Contact him for information or write Crane Co., Industrial Products Group, 4100 S. Kedzie Avenue, Chicago 32, Ill. In Canada, Crane, Ltd., 1170 Beaver Hall Square, Montreal.

NO WASP WAIST ON THIS VALVE



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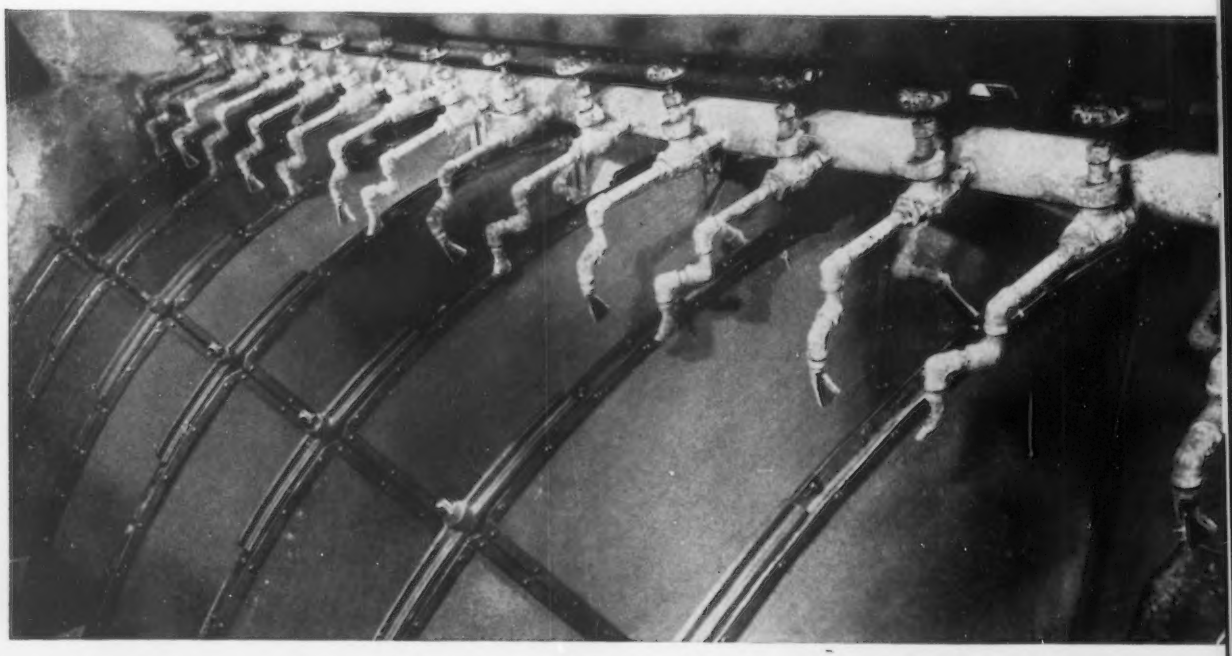
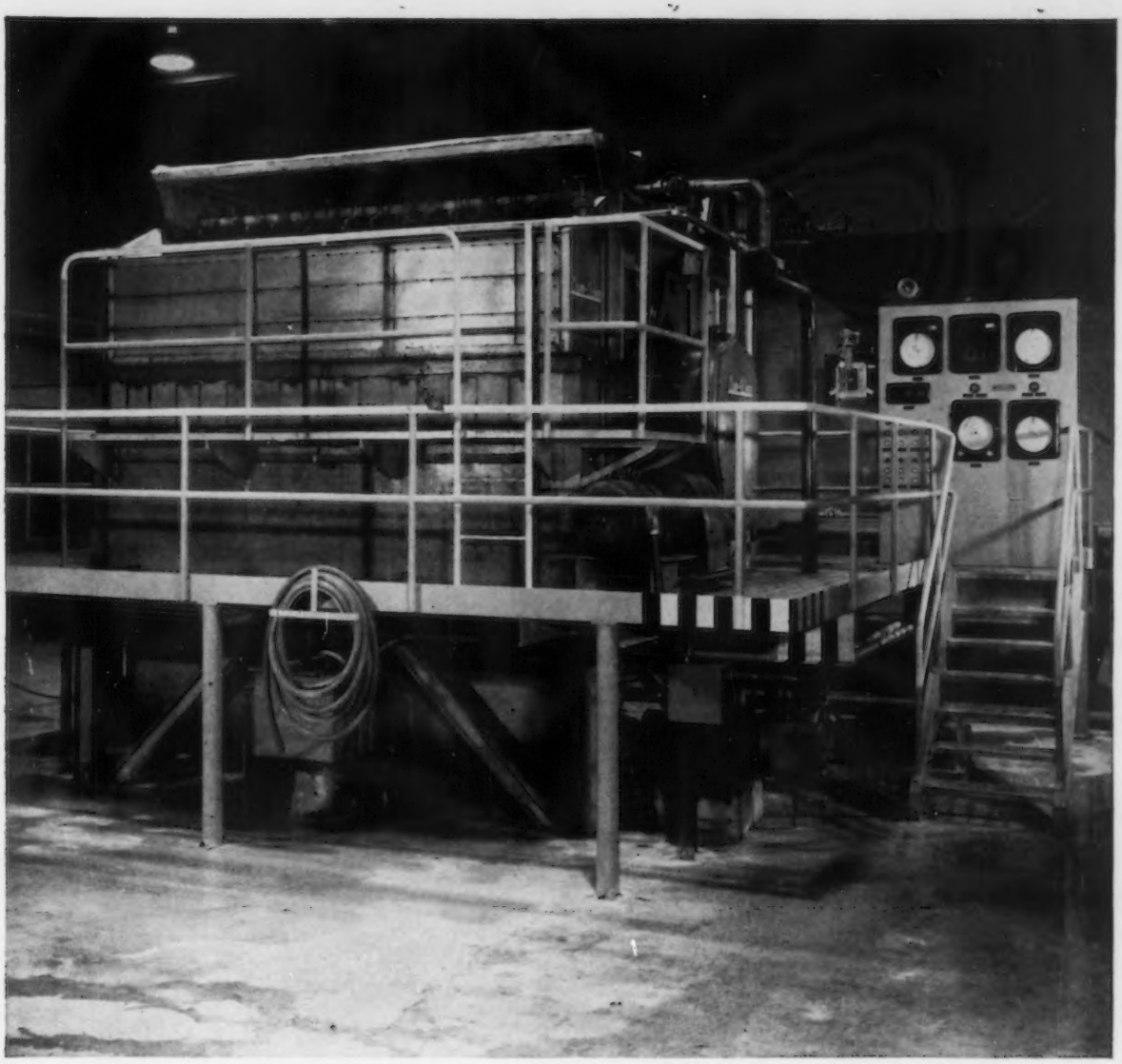
Effluent clarity ranges 0.0 to 0.25 lb. per 1000 gals.

Another example of the paper industry's wide acceptance of the American disc-type Saveall for maximum recovery of fiber from white water is seen in this installation at the well-known Hammermill Paper Company's Erie, Pennsylvania, Division.

The equipment handles white water from Hammermill's No. 7 machine, producing various grades of papers including Hammermill Bond and Hammermill Offset. Maximum flow is 1,200 g.p.m. Effluent ranges from 0.0 to 0.25 lb. per 1,000 gallons, showing the high rate of recovery achieved.

As well as excellent performance, the American Saveall offers the advantage of small space requirements, easy and quick replacement of filter disc sectors and fully automatic, continuous operation. Two sizes are available—9 ft. dia., with a maximum of 16 discs having 1,790 sq. ft. filter area and occupying 28 ft. x 12 ft. floor space; and 7 ft. dia. with a maximum of 10 discs and 700 sq. ft. filter area, requiring 9 ft. x 17 ft. floor space. For more information, write for Bulletin 3306 to Dorr-Oliver Incorporated, Stamford, Connecticut.





▲ Installation at Hammermill illustrates compact design and small floor space requirements of American Saveall.

◀ Close-up shows easily removable disc sectors and new "less splash" sluicing nozzles for continuous removal of recovered fibers, which are then returned to the stock chest.

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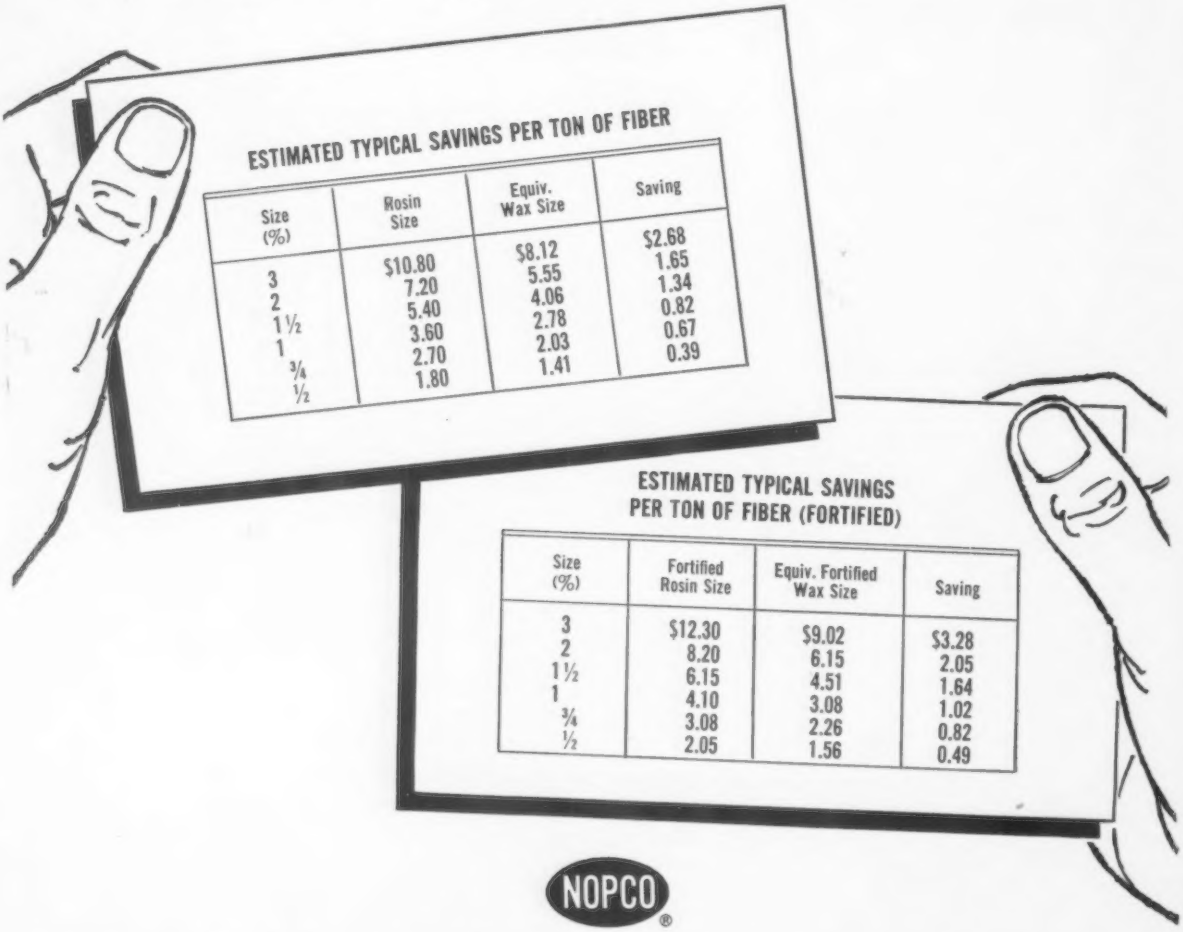
ESTIMATED TYPICAL SAVINGS PER TON OF FIBER
Size (%) | Rosin Size | Equiv. Wax Size | Saving
3 | $10.80 | $8.12 | $2.68
2 | 7.20 | 5.55 | 1.65
1½ | 5.40 | 4.06 | 1.34
1 | 3.60 | 2.78 | 0.82
¾ | 2.70 | 2.03 | 0.67
½ | 1.80 | 1.41 | 0.39
ESTIMATED TYPICAL SAVINGS PER TON OF FIBER (FORTIFIED)
Size (%) | Fortified Rosin Size | Equiv. Fortified Wax Size | Saving
3 | $12.30 | $9.02 | $3.28
2 | 8.20 | 6.15 | 2.05
1½ | 6.15 | 4.51 | 1.64
1 | 4.10 | 3.08 | 1.02
¾ | 3.08 | 2.26 | 0.82
½ | 2.05 | 1.56 | 0.49

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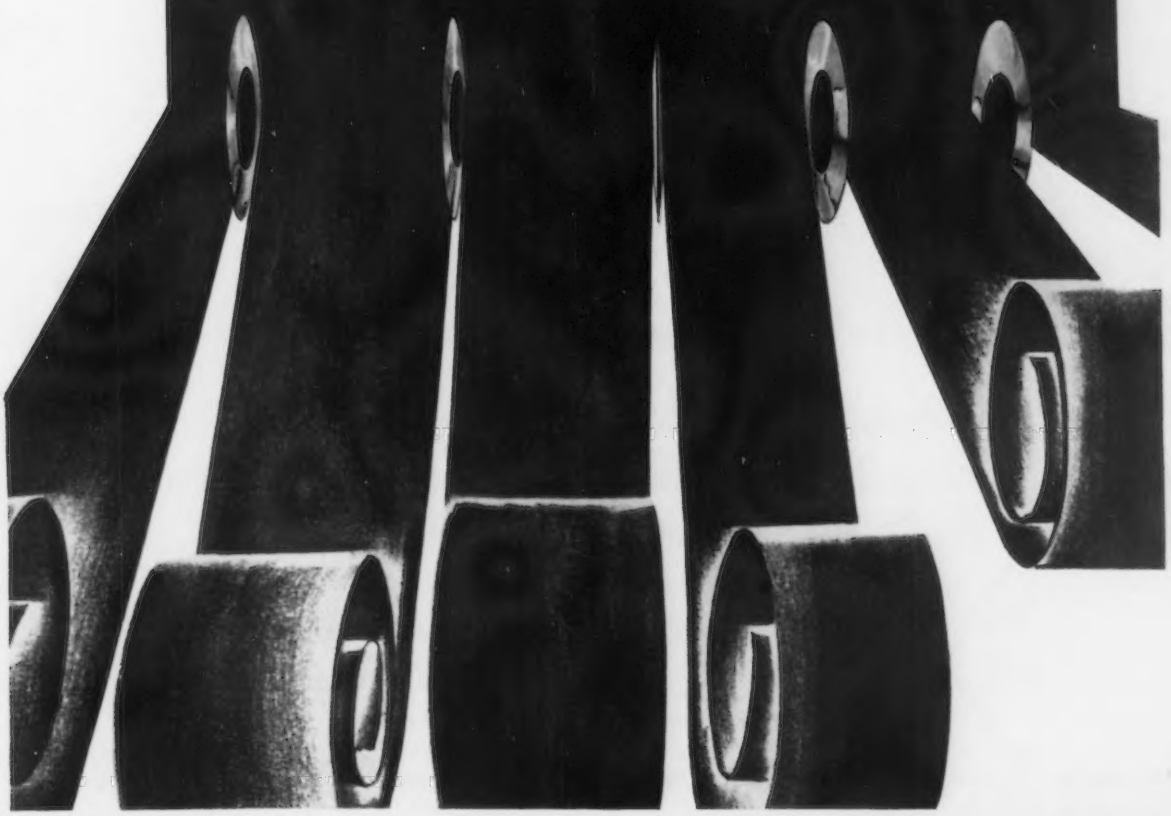

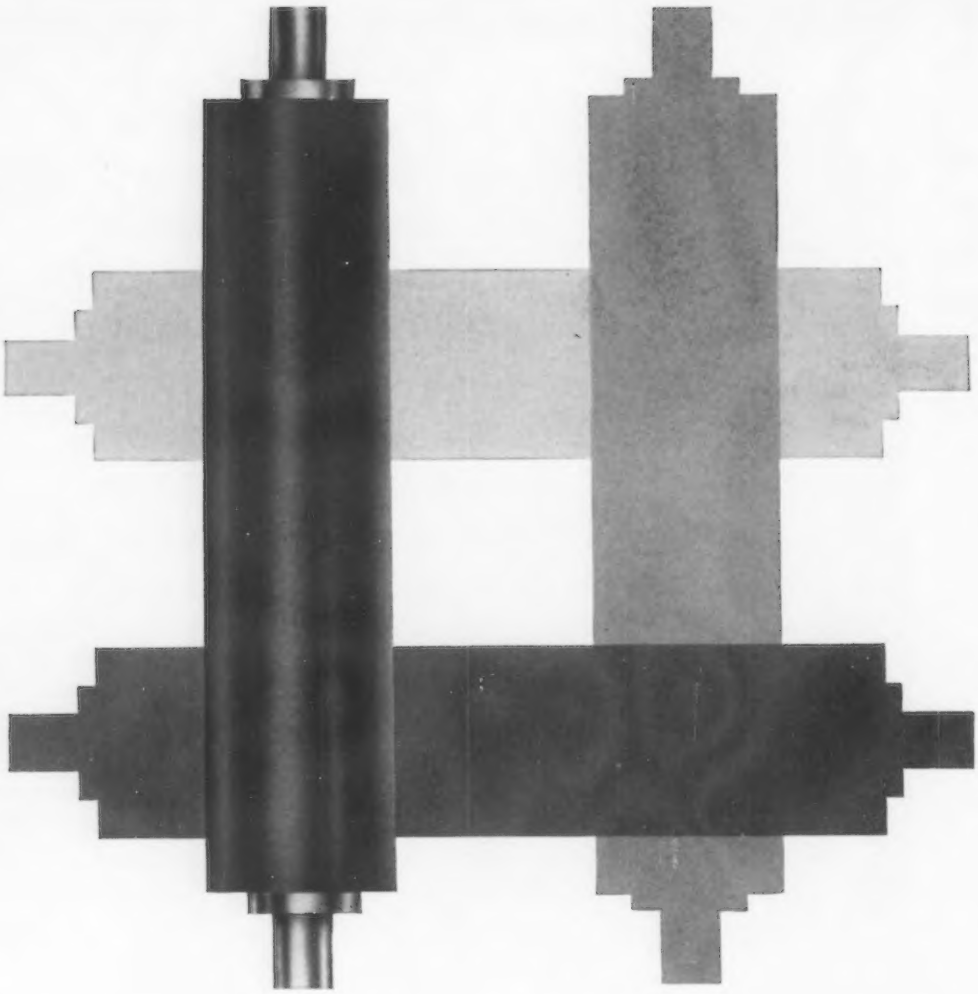

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Trends

Editor Evans Report: Dateline—London

U. K. Experienced a Banner Year

1960 was an outstanding year for Britain's paper industry. Production of paper and board was at a new record high and 11% above the previous year. Imports were up 16% but exports were off 5%. The country here has experienced a much milder recession than in the U. S. during the past winter and some upswing appears to be already under way. Per capita consumption of paper and board increased about 10% in 1960 to 234 pounds. This is still only slightly over half that of the figure for the United States. The difference between the two countries is made up entirely in board use for packaging and shipping, as British per capita use of printing papers is probably higher than in the United States. Demand for all grades except packaging was at a high level in March and packaging had picked up somewhat from the previous month. The two serious problems facing the British industry are the prospect of a pulp price increase and the threat of greatly increased imports of paper and board from Scandinavia due to tariff reductions. These are discussed in detail below. The North American industry has a vital interest in the prosperity of the U. K. industry since in recent years it has become a very important consumer of North American pulp.

Speeded Duty Reduction Causes Concern

The British paper and board industry is seriously concerned about the decision of the European Free Trade Ass'n (E.F.T.A.) to speed up import duty reductions. The date for the next reduction (10%) has been moved ahead to July 1, 1961. Their problem is that Scandinavia from whom they purchase large quantities of pulp will also be able to move strongly into the British paper and board market. It is obvious that manufacturing costs of the integrated Nordic mills are lower than that of the British mills depending as they must on market pulp.

Pulp Price Rise Anticipated

British papermakers expect that Scandinavian pulp mills will seek increases in pulp prices equivalent to $5-$10 per ton when third quarter prices are negotiated early in June. The rise is anticipated because of very large increases in the price of wood in Scandinavia as well as higher wages and shipping costs.

Production and Prices Up in '60

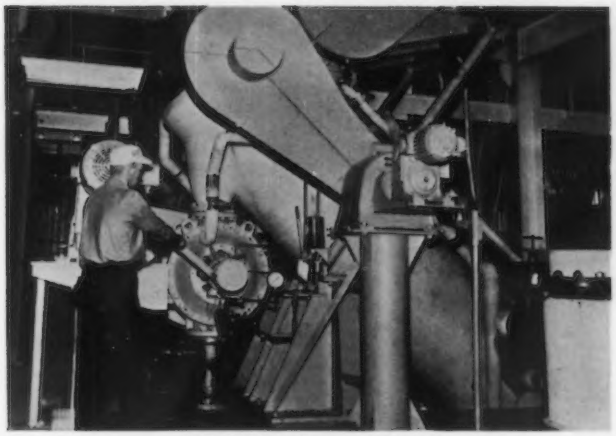
Paper and board manufacturers in Great Britain had a prosperous year in 1960, as is shown by their financial statements. Coupled with a new high in production was a 4 to 6% increase in prices for most grades during the year. However, in spite of this, profits did not keep pace with rising sales although relatively speaking they did better in this respect than did the mills in the United States.

Give your coated paper improved wet rub resistance!

In today's offset printing process, wet rub resistance is necessary to avoid cloudy inks and muddy colors. The addition of new DYLEX® K-54 latex in your offset coatings will give your paper improved wet rub resistance. The rubbing of the wet blanket won't fade inks or remove the coating. With this exceptional latex, your full color pages will reproduce clear and bright. ☐ Along with improved printability, paper coated with DYLEX K-54 has a higher degree of smoothness, superior bonding strength, and increased pick resistance. New DYLEX K-54 is easy to apply, foams less, and blends well with other paper coating additives. ☐ Learn how DYLEX K-54 can upgrade your coated papers. For more information on any of the new series of DYLEX latices for paper coatings write Koppers Company, Inc., Plastics Division, Dept. 2503, Pittsburgh 19, Pennsylvania.

KOPPERS PLASTICS KOPPERS

3 Types of Automatic Digesters To Increase Mill Capacity

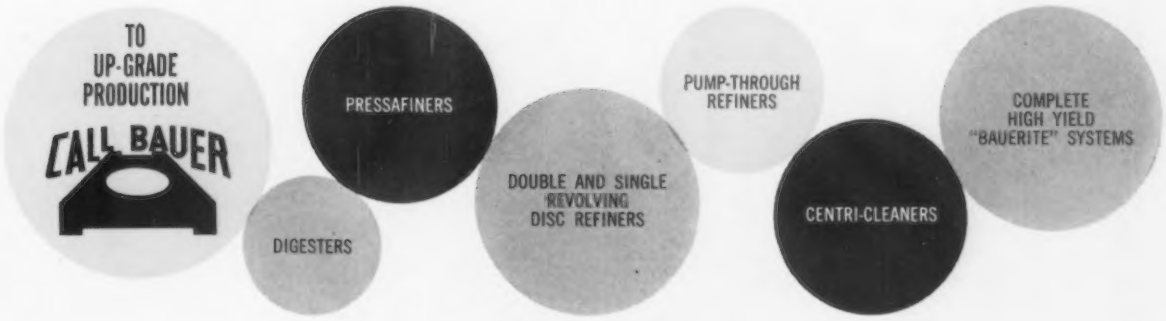


M & D Continuous Digester.
Note inlet and discharge valve are on same floor level.

M & D DIGESTER (continuous) — Inclined tube type... makes controlled continuous digestion of chips practical. Suitable for wide variety of end products as units are engineered to your requirements. Completely automatic; reduces labor costs, improves uniformity. 90% of unit can be outdoors.

RAPID CYCLE DIGESTER (batch) — Fast, automatically controlled batch cooking... high temperatures and pressures (up to 300 psi) reduce cooking time to minutes. For any type pulp and flexibility in procedures... ideal for multiple treatment—presteam, impregnate, vapor phase. Compact... easy to install. Stainless steel... no lining... long life.

GRENCO DIGESTER (continuous, vapor phase) — Most economical for vapor phase method of preparing wood chips... automatically controlled... simple in design. To increase output units can be "stacked." Automatic... continuous feeding and discharging... minimum space requirement... relatively light weight.



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Any way you look at it, Powell valve performance really pays off for the pulp and paper industry.

Since Powell pioneered the application of special alloys in valve design, you can today find industry's widest choice of valve materials for any problem of heat, temperature—corrosion or erosion caused by pulp and paper chemicals, liquors, bleaches and caustic compounds.

On the line, you'll also find Powell valves suitable for pneumatic, hydraulic or electric operation . . . and overall workmanship and construction that result in minimum downtime and low cost maintenance.

Learn how this Powell valve performance can pay off in your pulp and paper operations by contacting your nearby Powell Valve distributor or write The Wm. Powell Company, Cincinnati 22, Ohio.

150-pound W.P. Quick Opening Gate Valve. Bolted flanged bonnet, solid wedge, integral seat. Sliding stem can be locked in any desired position. Sizes, 2½" through 6"; with screwed ends, 2½" through 4".

150-pound Bronze Swing Check Valve. Bolted flanged Cap. Disc has sufficient lift to clear line of flow. Sizes, 2" through 8". Screwed end valves available in sizes 2" through 3".

200-pound W.O.G. Gate Valve. Body, bonnet, yoke, gland are Ni-resist. Solid wedges are Ni-resist with 316 stainless steel facing. Other trim parts are 316 stainless steel. Sizes, one-piece yoke, 4"; two-piece yoke, 5" through 12".

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POWELL PAPER MILL VALVES

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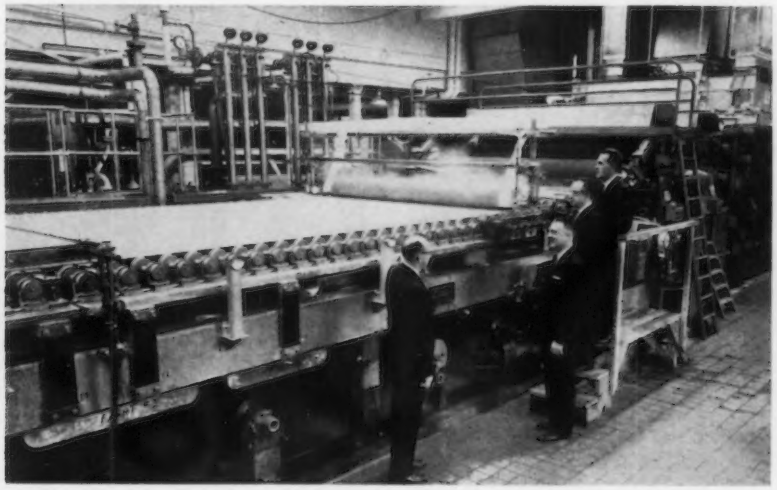
PAPER TRADE JOURNAL

WEEK OF APRIL 3, 1961



INSPECTING K-C'S NEW MACHINE are (l. to r.) D. H. Severson, mill manager; D. A. Hardt, manager of Kimberly-Clark business papers sales; A. D. Wilkinson, vice president of manufacturing, and W. B. Meyer, vice president of sales, industrial products division.

K-C Completes First Project in Multi-Million Dollar Expansion Program

Kimberly-Clark Corp. has announced completion of a major expansion program at its Neenah Paper Division at Neenah, Wis., with the start-up in March of a new paper machine producing a variety of fine writing papers and specialty sheets. Start-up of the machine, completely rebuilt from a machine originally installed in 1921, climaxes more than a year of modernization at the three-machine mill to provide increased production capacity, flexibility and improved quality control.

Completion of the project gives Kimberly-Clark one of the most automated and efficient production units in the fine paper segment of the industry, company officials said. The complex new machine is designed for a daily capacity of up to 35 tons, more than twice the capacity of its predecessor. It increases the fine paper producing capacity of the Neenah Paper Division by up to 50 per cent, the company reported.

The extremely versatile unit is capable of making a complete range of cotton content and mixed wood and cotton fiber grades, especially in the lighter weights.

Also included in the modernization program was expansion of the stock preparation system to increase the mill's capability of preparing any type of fiber to meet customer end-use requirements.

Brown Announces Major Expansion Program

A major expansion of production facilities at Brown Co.'s Cascade paper mill in Gorham, N. H., has been announced by Leonard A. Pierce, president of the northern New England pulp, paper and forest products firm.

The new facilities, authorized by the company's board of directors at a meeting late in March, will include installation of a new 101-inch paper machine together with all stock preparation and finishing equipment needed for the manufacture of sanitary tissue.

Relocation of paper mill supplies and spare equipment into a new addition to the mill, and changes in towel manufacturing, storage and shipping facilities, are also included in the proposed expansion.

Brown Co., one of the nation's leading producers of paper towels for industrial and institutional uses, pioneered the development of the wet strength paper towel. The company has offered tissues for a number of years, but manufacture has been on a contract basis.

Cost of the expansion at Cascade was not announced. Manufacture of tissue will be under the direction of Conrad T. Waldie, Jr., vice president and general manager of the towel division. Preliminary work on the new facilities will start immediately and should be completed in approximately one year, Mr. Waldie said.

Scott Starts Up New Machine for Lightweight Papers

Scott Paper Co. announced last week the start up of a new, high-precision paper machine for the manufacture of cultural grades such as lightweight printing and offset papers at its Southern Division plant in Mobile, Ala. The company invested more than $20,000,000 in the machine and supporting facilities.

G. Willing Pepper, a Scott vice president, made the announcement at a breakfast for a number of National Paper Trade Association delegates that Scott Mobile Number Nine, as the new papermaking unit is known, is operating. Mr. Pepper's responsibilities include directing the Scott Sales Division that will merchandise the output of Number Nine, mainly through paper merchants and converters. Number Nine has wide capabilities, but Mr. Pepper stressed

Scott's determination to "give special attention to the various grades of offset." He explained that the outlook for offset papers was particularly bright.

Utilizing pine and hardwood pulps produced at Mobile and delivered to Number Nine's stock preparation system in slush form, the Beloit machine is designed to make 20 lb. to 80 lb. (24 x 36 — 500) basis weight paper at speeds up to 2000 f.p.m. Capacity is 200 tons per day. Equipped with a wire 237 inches wide and 137 feet long, the machine trims 214 inches.

There are four dryer sections independently controlled for speed and steam with four additional dryers located between the last two calender stacks. The press section has three suction presses and one smoothing press. The machine is equipped with a suction pick-up.

Wash coating facilities for Number Nine consist of a horizontal size press following the second dryer section and another following the third dryer section. A five roll calender stack precedes the second size press. A small amount of coating can also be applied on the first of the final two calenders.

Sorg Reorganizes Two New Companies

Sorg Paper Co. has reorganized two of its recently acquired companies under the Sorg name and has chosen a slate of officers for the new corporations.

Royal Imprints Co., of Lewisburg, Pa., becomes Sorg Products Co., with general offices and marketing offices at Middletown, Ohio, and imprinting, shipping and warehousing operations at Lewisburg.

Groff Paper Co. of St. Paul, Minn., manufacturer of high quality napkins, wipes, towels and related tissue products, becomes Sorg Products Co. of Minnesota.

D. G. Driscoll, president of Sorg Paper, becomes chairman of Sorg Products; C. J. Tranter, administrative vice president of Sorg Paper, is president of the new firm, and Miss Evelyn C. Olson, formerly general manager of Groff, becomes treasurer and controller.

F. A. Guldager, formerly director of sales for Paper Arts Co., Inc., Indianapolis, was appointed director of marketing for Sorg Products.

Champion Paper Shareholders Vote To Acquire Carpenter Paper Co.

Shareholders of The Champion Paper and Fibre Co. have voted overwhelming support of the management's proposal to acquire one of the country's most successful paper distribution chains. Their specific action was to authorize nearly two million additional shares of Champion common stock. Of these additional shares, 1,290,770 will be used to acquire the Carpenter Paper Co., wholesale distributor of paper in the 26 states of the Mid-West, Far West and Southwest. Carpenter shareholders, meeting in Chicago, voted to approve the exchange of the Carpenter assets for Champion shares.

Of 4,689,703 shares of Champion stock outstanding, 3,849,688 for more than 82 per cent were voted in favor of the management proposal. Carpenter shareholders voted more than 90 per cent of their shares in favor of the proposal. It was the highest such vote in the company's history. The overall percentage of Champion shares voted on the proposition, it was said, also represents a record for such shareholder participation.

Champion, a major producer of fine printing papers and other paper products, did more than $195,000,000 worth of business last year. Carpenter, headquartered in Omaha but with sales outlets and warehouses in 33 cities, grossed $107,000,000 last year. Under the acquisition, Carpenter will be a wholly owned, separately managed operation of Champion, distributing both Champion papers and the products of other companies as it has in the past. Kenneth C. Holland, president of Carpenter, will continue in that position and also is slated to be proposed for membership on the Champion board. According to Mr. Holland, Carpenter's organization will remain unchanged.

Champion's president, Karl R. Bendetsen, attending the special shareholders meeting in Hamilton, Ohio, home of the company's general office, pointed out, "by broadening our base of operations in the merchandising field, we'll be better able to absorb the effects of changing ratios of production capacity to paper consumption in any single segment of the industry at any given time."

Syracuse Forestry College To Mark 50th Anniversary

The State University College of Forestry at Syracuse will mark an important milestone in April.

Its golden anniversary, being observed throughout 1961, will be climaxed by a three-day birthday celebration April 12, 13, and 14.

Technical symposiums, an academic convocation, 50th anniversary banquet, an alumni luncheon, class reunions, and a special program for the ladies, and a whole host of other special events will make the occasion one that will be long remembered by many an "old grad."

IPC Accepting Reservations For Microscopy Course

Reservations are being accepted for the 17th Fiber Microscopy Course to be held at The Institute of Paper Chemistry in Appleton, Wis., April 17 through 28. Through both lecture and laboratory sessions, the course will offer a practical study of the microscope, fiber analysis, the use of reagents and stains in fiber identification and evaluation, and the application of microtechniques to pulp and paper research.

Course director will be Dr. I. H Isenberg, research associate at the Institute. Information on the course is available from George D. Jernegan, director of continuing education, The Institute of Paper Chemistry, Appleton, Wis.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the week ending March 18, 1961, at 91.1 per cent, compared with 91.9 per cent, revised, for the preceding week. The ratio was 98.7 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the week ending March 18, 1961, at 91 per cent, compared with 93 per cent for the preceding week and 94 per cent for the corresponding week a year ago.

(Detailed Statistics on page 52)

PAPER PEOPLE

S. H. Popovich

Popovich Joins Westfield As Technical Director

Westfield River Paper Co., Inc., has named Sam H. Popovich as technical director. He is a 1950 graduate of the Pulp and Paper School of the College of Forestry at Syracuse University. From 1950 to 1959, he served successively as director of quality control, technical director, and director of research and development for the Hamilton Paper Co. at Miquon, Pa.

Immediately prior to joining Westfield River, Mr. Popovich served as director of technical service and development for the Paper Chemicals Division of the W. F. and H. Jordan Manufacturing Co., Philadelphia, Pa.

Mr. Popovich will be located at the principal office of the company at Russell, Mass., and will be responsible for all technical operations at the Glassine and Greaseproof mills at Russell and Lee, Mass., and at West Conshohocken, Pa.

Pollard Advances At Great Northern

David F. Pollard has been appointed to the position of manager of manufacture of the Great Northern Paper Co.

Mr. Pollard has held the position of assistant manager of manufacture since June 1960, and previous to that time, had successively held positions as technical director and production superintendent. He is a graduate of Tufts College with a B.S. in chemical engineering.

Langley Joins Howard Smith at Cornwall

J. G. Langley has been appointed assistant mill manager of the Cornwall Division of Howard Smith Paper Mills, Ltd. He will reside in Cornwall. Mr. Langley was formerly mill engineer of the Donnacona Paper Co., Ltd., Donnacona, Quebec. He was born at Peterborough, Ontario, and graduated in 1939 from McGill with a B.Sc. (electrical). Following graduation he joined the General Electric Co. From 1940 to 1945 he served with the Royal Canadian Artillery in Canada and overseas, being discharged as a Major. On his return to Canada he re-joined GE in the apparatus department in Toronto, but left in 1947 to become assistant electrical superintendent in 1949 and mill engineer in 1953.

Kimberly-Clark Names Appert Vice President

R. J. Appert has been elected a vice president of the Kimberly-Clark Corp., John R. Kimberly, board chairman, announced.

Mr. Appert, with the company since 1937, has been vice president of Kimberly-Clark's Canadian associate, Spruce Falls Power & Paper Co., Ltd., Toronto. He has left that position for his new post.

Great Northern Elects Directors

Great Northern Paper Co. at its annual meeting held March 15 elected Hoyt Ammidon, Robert A. Haak and J. H. Heuer directors of the company.

Mr. Ammidon is president of the United States Trust Co. of New York, a trustee of Greenwich Savings Bank, a director of The Fidelity and Casualty Co. of New York, The Perkin-Elmer Corp., and other companies.

Mr. Haak is vice president-sales of the company, and has been associated with the Great Northern sales department since 1934. He has been a vice president since 1957.

Mr. Heuer is vice president—manufacturing, and has been associated with the company since 1951. Formerly he was connected with Oxford Paper Co., Diamond Match Co., Newton Falls Paper Co., Inc., and St. Regis Paper Co., where he was technical director prior to joining Great Northern. Mr. Heuer has been a vice president since 1959.

T. J. Fahey

Byron Weston Elects Fahey President

At the annual meeting of Byron Weston Co. held at Dalton, Mass., on March 18, the board of directors elected Thomas J. Fahey president and named Robert Crane chairman of the board. Alexander Euston was re-elected vice president and clerk.

Mr. Fahey has been associated with Byron Weston since 1936. He has been a director of the company since 1956 and treasurer since 1957. In 1960 he assumed the additional duty of general manager and was in charge of the $2 million modernization program completed recently with the installation of a new paper machine and associated stock preparation equipment.

Mr. Crane joined the company in 1924 and served as sales manager, secretary, director and vice president prior to his election as president in 1954.

Glatfelter Elects V-P, Administration

P. H. Glatfelder Co. has announced the election of J. R. Atwater as vice president, administration.

Prior to Mr. Atwater's new appointment he served as assistant to the president. He joined the Glatfelter company in 1957 and has been associated with the pulp and paper industry for many years.

Mr. Atwater is a graduate of Syracuse University and a native of Richmond Hill, Long Island.

PJT NEWS OF CONVERTERS

IP to Start Up New Container Plant in Oct.

International Paper's Container Division will start operations in October at a new 260,000-square-foot plant at Northlake, Ill.

Arthur B. Damon, division general manager, said the facilities, which will manufacture corrugated shipping containers, will be the largest International Paper operation of its type. The plant is being constructed on a 22-acre tract on the Illinois toll highway at Grand Avenue about one mile from O'Hare International Airport.

The new Container Division plant will be equipped with corrugators and all other equipment necessary to convert kraft board into corrugated containers of all types. The installation augments the present Container Division facilities at 5133 West 65th Street.

"The new plant will enable us to serve our customers and potential customers better in the rapidly-expanding Chicago land area," Mr. Damon said. "In addition to railroad shipping facilities, the proximity of the Illinois toll highway and other arteries will permit overnight deliveries to more and more customers desiring quick service."

Hutchins D. Kealy is resident plant manager; Dennis J. Mollahan, sales manager; and Lawrence L. Capek, plant superintendent.

The new plant will be more than double the size of the existing facilities and will be equipped with the most modern machinery in the container industry. The modern facilities will include an employes' lunchroom, as well as other convenience features—such as large paved parking lots for employes and visitors.

The Perini Corp., Framingham, Mass., is general contractor for the project. Ragnar Benson, Inc., of Chicago is the architect. Land for the new plant was purchased from the Chicago and Northwestern Railroad.

APS Paper Elects Miller President, Board Chairman

Robert P. Miller has been elected president and chairman of the board of APS Paper Corp., one of the nation's leading paper converters.

Mr. Miller was formerly president of the company when it operated as a division of Rapid-American Corp. and was a vice president and director of Rapid-American, its parent company. The paper company was sold to a group of investors headed by Mr. Miller and others of operating management last January.

Previously, Mr. Miller was a director and vice president of American Colortype Co., which was merged into Rapid-American in December, 1957.

With office headquarters at 310 Fifth Avenue, New York City, APS Paper Corp. has five operating divisions: United Leather Goods Corp., Brooklyn, N.Y.; American Paper Specialty Co., Chicago, Ill.; Eastern Tablet Co., Albany, N.Y.; Osborn-Midwest Paper Co., Marion, Ind., and Smith-Stewart Paper Products Co., Brooklyn, N.Y.

Milprint Announces Three West Coast Promotions

Three West Coast managerial promotions have been announced by Milprint, Inc., national packaging converter.

Ray Schmitz, formerly district sales manager in San Francisco, has been named to the post of regional sales manager of the West Coast. Mr. Schmitz started with Milprint in 1953 as a salesman in the Fresno, Calif., area. He previously served as salesman for the Pacific Waxed Paper Co.

James McFaul has been named new sales manager to replace Mr. Schmitz in the San Francisco district. Mr. McFaul joined Milprint in 1955 as salesman in the San Jose, Calif., area. A graduate of the Merchant Marine Academy, he has totaled some 11 years of sales experience in various fields.

Richard Gresham, a Milprint salesman for 13 years, has been appointed district manager of direct sales in the Southern California area. He also has experience in industrial engineering and chemistry. He attended the University of Southern California, was graduated from Illinois State Normal University, and received a Master's degree from Northwestern University.

"Extra tough conversion problem?"

Consulting Firm Formed In Butler, Wis.

A new firm, Convertors' Machinery and Controls, Inc., Butler, Wis., was developed to assist the industrialist of today in solving the ever-mounting problems of diversifications of products, increased production, cost reduction, production controls, organization (managerial, supervisory and direct labor), plant layout, machinery conversion, installation, training programs and profit and expense controls.

This organization consists of men who have devoted their time and effort to develop a staff of experts to fulfill the requirements of the paper converting industry, regardless of size.

All of these men have a background of 20 years or more in assisting the industrialist with his problems. The staff consists of designers, engineers and consultants in every phase of business organization and machine design.

Directors of this company are: Walter Westphal, plant manager and chief engineer, Rexford Paper Co., Milwaukee, Wis., Everett S. Faulls, president, and Walter R. Stelling, Jr., secretary and treasurer, both of Faustel, Inc., Butler, Wis. David A. Davidson, formerly associated with Consultants Engineers, Inc., Portland, Ore., and Central Paper Co., Menasha, Wis., is the vice-president of Convertors' Machinery and Controls, Inc., and will manage all operations of the corporation.

This BIRD CENTRISCREEN

occupying 30 sq. ft. of floor space and totally enclosed

replaced six open type screens occupying 300 sq. ft.

OTHER ADVANTAGES:

high capacity
Model 14 up to 6000 gpm
Model 10 up to 3000 gpm
Model 6 up to 1200 gpm

exceptional performance
continuously clean, shive-free, lump-free, slime-free stock

fewer breaks

reduced downtime

faster paper machine operation

Ask us for recommendations, layouts and estimates.

BIRD MACHINE COMPANY

SOUTH WALPOLE, MASS.
REGIONAL OFFICES: EVANSTON, ILLINOIS
PORTLAND 4, OREGON · ATLANTA 9, GEORGIA
Canadian Manufacturers of Bird Machinery
CANADIAN INGERSOLL-RAND COMPANY, Limited, Montreal

RCA introduces a cost-saving new

Electronic Paper Inspection System

for detecting creases, calender cuts, holes, spots and gloss imperfections

At least ten times faster than visual inspection, this new electronic equipment was developed by RCA to meet a need for automatically detecting and classifying imperfections in paper. Here is a quality control device which permits higher inspection speeds than ever before possible, with more consistent results, for maximum economy.

The surface of the paper is continuously monitored as it passes over a roller at linear speeds up to 1000 feet per minute. In this manner, creases, calender cuts, holes, spots, gloss imperfections, etc. are detected and the paper may be classified in such categories as "Accepts" and "Rejects," or "Firsts," "Seconds," and "Rejects," depending upon customer requirements.

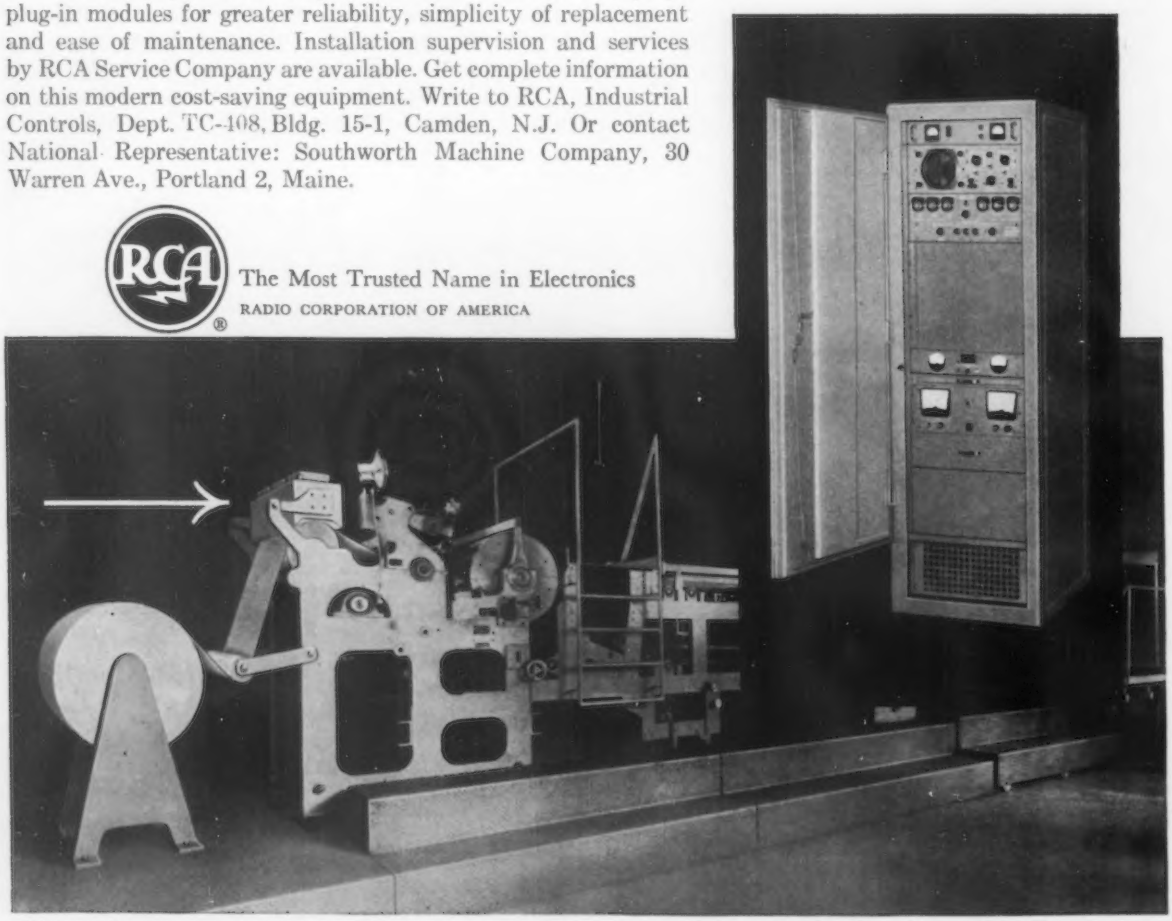
This RCA equipment is completely transistorized and employs plug-in modules for greater reliability, simplicity of replacement and ease of maintenance. Installation supervision and services by RCA Service Company are available. Get complete information on this modern cost-saving equipment. Write to RCA, Industrial Controls, Dept. TC-408, Bldg. 15-1, Camden, N.J. Or contact National Representative: Southworth Machine Company, 30 Warren Ave., Portland 2, Maine.

- All controls mounted in one rack.
- At least 10 times faster than visual inspection —and far more consistent.
- Drift-free inspection standard.
- Only one head required for checking all types of defects.
- Non contact type inspection.
- Equipped with built-in lamp burn-out alarm system and test signal generator for checking performance of each channel at all times.

RCA

The Most Trusted Name in Electronics

RADIO CORPORATION OF AMERICA



RCA Electronic Paper Inspection System installed before the cutter, and on a Maxson Sheet Handling Apparatus. Inspection head is indicated by arrow at left, control rack is shown at right. NOTE: Only one inspection head and one control rack are needed for detecting all types of defects. Control rack can be located remotely from inspection head.

FOR INFORMATION ON THIS OPTICAL PAPER INSPECTION SYSTEM WRITE

SOUTHWORTH MACHINE CO.

RCA NATIONAL REPRESENTATIVE, 274 WARREN AVENUE, PORTLAND, MAINE

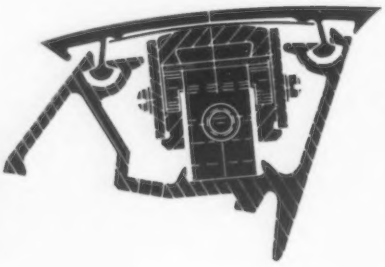
The appointment by RCA as national representative for its Optical Paper Inspection Equipment marks another step in Southworth's objective of providing paper mill management with a comprehensive service aimed at cost reduction.

As you will read in RCA's story on the opposite page, this new equipment brings to the vital finishing room operation of inspection a speed and an accuracy heretofore unavailable because of human limitations and fallibility.

How you might incorporate RCA Optical Paper Inspection Equipment as part of a more efficient and completely integrated Southworth finishing room System is still another reason for considering an early Southworth study of your particular plant problems and requirements.

Paper Conditioners; Automatic Carton Sealer; Lift Tables; Air-Lift Tables; Cutters; Deliveries; Layboys; Skid Turners; Hand, Foot, Motor Driven Punching Machines; Humidifiers; Envelope Presses; Punch Heads; Tabbing Knives; Corner Cutters; Custom Built Allied Equipment.

NEW EQUIPMENT & SUPPLIES



Wire Doctor Replaces Table Rolls

An adjustable hydrofoil, the Lodding Fourdrinier Wire Doctor, is specifically engineered as replacements for table rolls. The wire doctors are designed to eliminate the pressure ridge that is generally associated with table rolls, and to maintain a control over drainage from the wire to a degree not possible with table rolls. Also, snap back of the fourdrinier wire is said to be minimized, all of which results in improved sheet formation. Since the doctor is a stationary unit, the cross section of the cover and head assembly is not dependent on the width or speed of the machine. Consequently, mechanical problems of whip, resonant vibration and bearing maintenance don't exist.

The wire doctor consists of a stationary, semi-rigid extruded cover, head assembly to provide for adjustment of the cover, a support beam and brackets for mounting. In operation the cover's beveled leading edge both supports the wire and skives water from its underside. Camber of the cover can be freely adjusted while the machine is running to regulate the amount of drainage induced by vacuum through the wire. Comparable flexibility with table rolls can be achieved only through substitution of rolls of differing diameters.

Drainage induced by a wire doctor is generally comparable to that of a table roll. Since wire doctors may be installed on a minimum of six-inch centers, it is usually possible to replace table rolls with a greater number of wire doctors, thereby increasing the overall drainage capacity of the fourdrinier.

Two piece support brackets are placed at each end of the beam: one, attached directly to the doctor assembly, the other, specially designed for each installation is mounted on the table roll rails. Screws in the machine mounted brackets provide height and tilt adjustment.

Lodding reports that experience, drawn from many field installations on machines running a wide range of stocks at various speeds, shows best results are achieved when wire doctors are installed in series, at or near the section where sheet formation begins, and when the last unit is followed by a well-designed drainage board. Manufactured under license from Dominion Engineering Works, Ltd. of Montreal, Lodding wire doctors are available for all machine widths and speeds from Lodding Engineering Corp., Auburn, Mass.

Cast-Iron Rotary Valve Feeders Offer High Savings

The availability of a complete line of cast iron rotary vane feeder valves and airlocks is announced by The Young Machinery Co., Inc., Muncy, Pa. According to chief engineer Robert Heyl, the feeder valves offer high

quality construction at savings to 40 per cent.

The Young air-lock rotary vane feeder valves have cast iron housings and fabricated steel rotors. They are also available with cast stainless, aluminum and alloy iron bodies, as well as with special corrosion resistant and plated coatings. The rotors can be furnished in aluminum, stainless steel and other special materials.

The design is available in 6, 8 and 10 inch square inlet sizes. Blow-through air-locks with cast iron bodies are available in 3 inch and 4 inch pipe diameters.

REVOLUTIONARY • PROVEN
PREFERRED
DRAPLEX
NEEDLED
Felts
MADE ONLY BY
DRAPER BROTHERS COMPANY
CANTON, MASS.

Overhead Crane Styled With Low Silhouette

A line of overhead electric traveling cranes suited to paper and pulp industry's particular handling requirements has been announced by Manning, Maxwell & Moore, Inc., Shaw-Box Crane & Hoist Division, Muskegon, Mich. Known as the Shaw-Box Series "D" line of cranes they are available in capacities ranging from 3 to 25 tons, spans to 80 feet, and come equipped for floor or cab operation. Operating advantages are offered through low-silhouette trolley design which permits installation close to roof trusses to provide high hook lift and greater utilization of space beneath the crane; and through the ability to make close end approaches to the building walls.

Bridge design features include: box section girders with internal diaphragming; rotating axles with anti-friction bearings and direct drive at wheels; double-flanged forged-steel wheels; tapered wheel treads; rubber bumpers at end trucks. End trucks are welded box sections, with built-in rail sweeps.

A self-contained drive unit, is located at the center of the bridge span and coupled to the cross shafting which connects directly to the rotating wheel axles. Cross-shafting is supported by closely spaced self-aligning pillow-blocks having sealed, radial thrust ball bearings.

Trolley design features are: All steel frame welded into a single unit with integrated hoisting machinery; welded rolled steel rope drum with deep-machined right and left hand grooves; drum and load sheaves have diameters at least 24 times the hoist rope diameter; and double-flanged forged-steel wheels operating on rotating axles equipped with anti-friction bearings.

Trolley traversing and hoisting machinery have helical heat-treated gearings, operating in sealed housings in a bath of oil. Hoist and trolley motors are flange mounted, designed especially for crane service and are 30 minute rated. Two positive acting brakes are provided. The hoisting unit also has an adjustable upper and lower limit stop to prevent overtravel of hook.

Tapered Cartridge with Bottom Entry Feature of Ball Valves

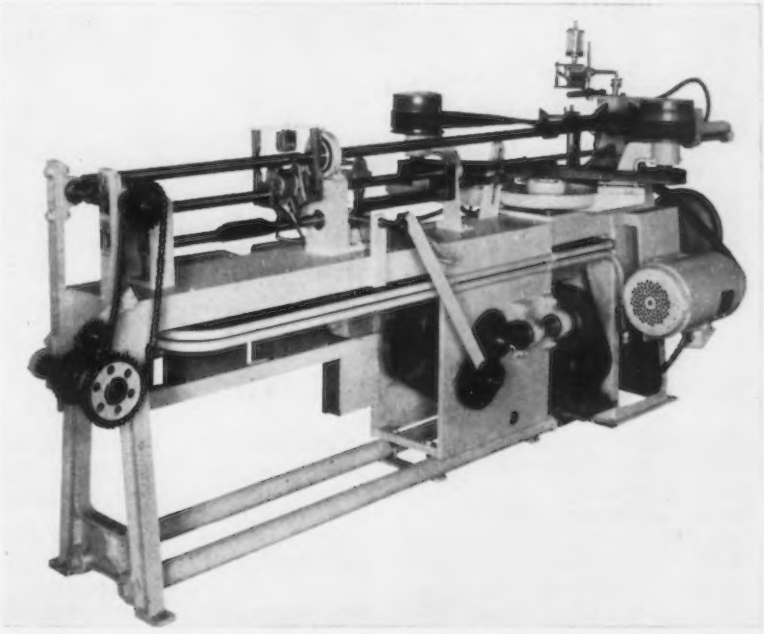
Crane Co. has announced its entry into the ball valve field with the production of models in bronze, steel, and 316 stainless steel in a range of sizes from ¼ to 2 inches.

The valves are rated for pressures from vacuum to 8000 p.s.i., and for temperatures from —40° to 400°F. They are two-directional, with low operating torque and precision-machined, chrome-plated ball. The seats are Teflon with controlled pre-loading to maintain bottle-tight shutoff even in air and gas service.

A design feature of the line of ball valves is the tapered cartridge which contains the entire seating assembly and which may be removed easily while the valve body remains in the line. Removal of a single retainer nut, requiring no special tools, permits the cartridge to be ejected from the bottom of the valve body. Reassembly of the cartridge is said to be simple, with all parts marked. There is full interchangeability of parts and there are no shims, springs or other special adaptations required.

When the cartridge is replaced in the body, the tapered design positions it automatically, and take-up on the retaining nut results in proper seating contact. In addition, O-ring seals on both stem and cartridge ensure proper closure, and a Teflon thrust washer between the stem and stem retainer prevents displacement of the ball.

The handles of the valves require only a quarter of a turn from full open to full closed, and they are plastic-sheathed for insulation. The bright orange sheaths also serve to flag valve position, since the handle is parallel to the pipe line when the valve is open.



MECHANICAL CORE MACHINE has a production capacity up to 200 lineal feet of finished cores per minute. The machine has a newly-designed winding head mounted in anti-friction bearings and driven by timing belts. Other features include score cutters for clean cut ends on finished cores, positive simple drive (mechanically timed), adhesive applicating unit and controls, automatic safety overload, festoon unwind stands available for continuous operation. This unit can be used in conjunction with a one color Flexographic press for product identification. Paper Converting Machine Co., Green Bay, Wis.

HYSTER

Hyster 2,000 and 2,500 lb. cushion tire lift trucks—industry's newest and finest.

WRITE YOUR OWN TICKET

"American Industry" is a phrase which really means a lot of companies, each with individual requirements for working capital and equipment. This great variety is the reason Hyster's Custom Leasing Plan was created. Now you can virtually write your own ticket for both equipment and financing to meet your material handling needs.

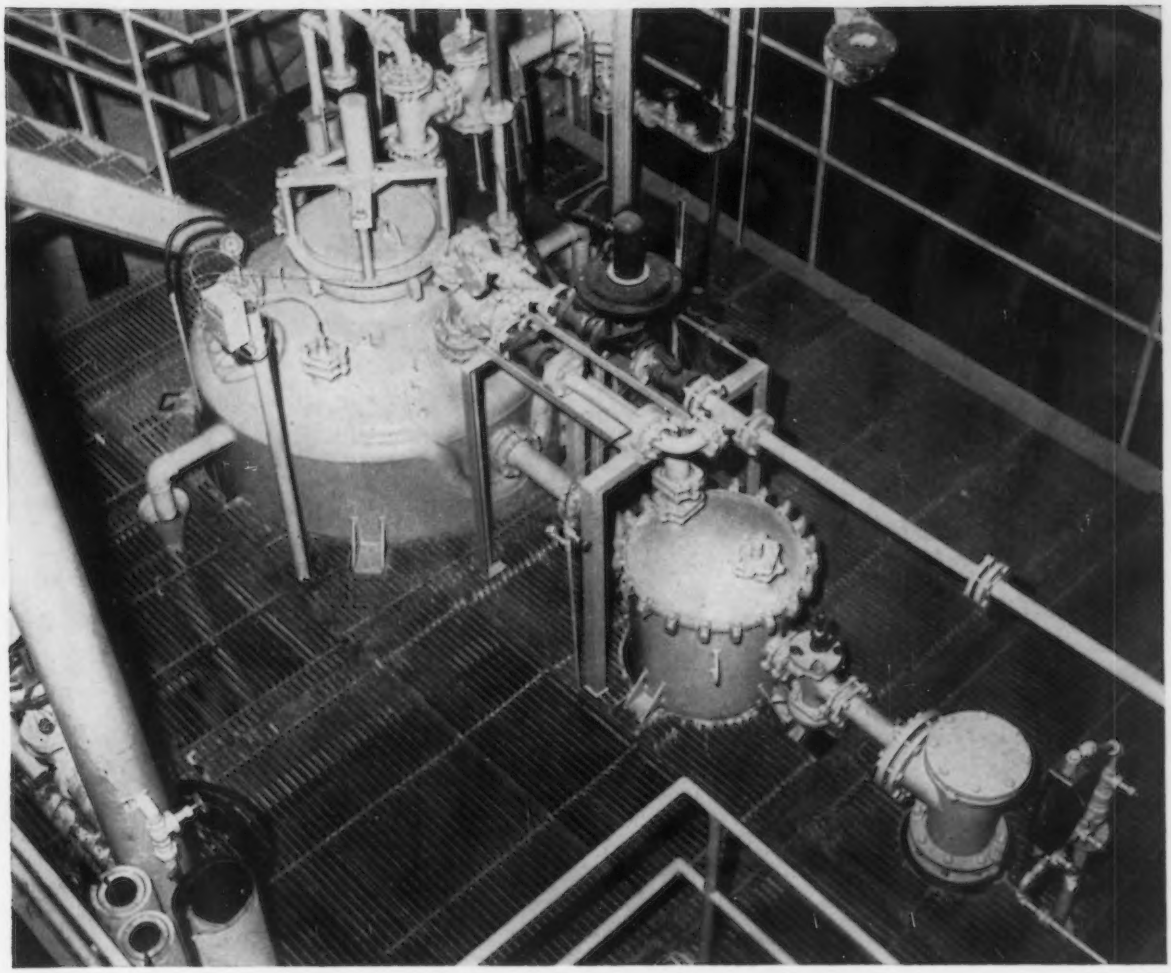
This plan puts the newest and finest lift trucks to work for you on your own terms. You can rent, lease or buy... one truck or a fleet... by the day, week, or month... for one day or five years. You can do your own maintenance or choose a plan that includes it. You can select any combination of rentals, with or without option to buy.

Financing is equally flexible, and the choices are offered in your own area by your Hyster dealer, who will be pleased to work with you to survey your needs for trucks and attachments. Talk with him soon about Custom Leasing... the plan that makes it easier than ever for you to use the equipment that sets the engineering pace for all lift trucks.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

HYSTER COMPANY
HYSTER LEASING DIVISION
P. O. Box 4318 • Portland 8, Oregon

FLUIDICS* AT WORK



Tell us your ClO_2 requirements ...we'll take it from there

If you're contemplating the construction or expansion of a chlorine dioxide generating system, now is a good time to contact the Pfaudler Project Engineering group.

This is a *service* group—set up to provide a *temporary* addition to your engineering staff.

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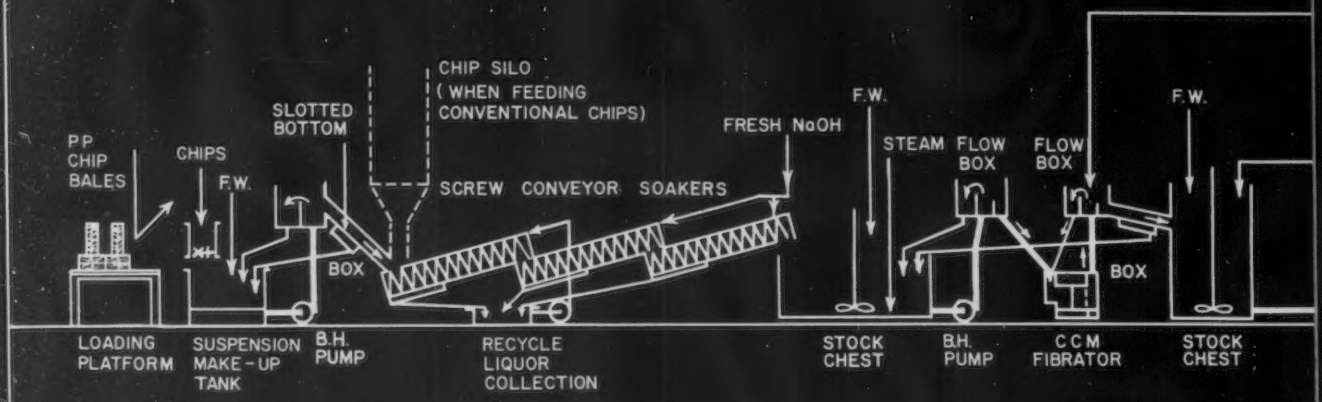


Using "Cloven" Chips Produced in the Woods . . . .

French Cold Soda Plant Produces Superior Pulp for Newsprint Furnish

This exclusive article describes highly significant facets to La Chapelle's • continuous cold soda pilot plant • chipping and chip baling at the logging site • stone ring fiberizer • chip slurry pump

Ernest F. Barker,
European Editor,
Paper Trade Journal

Papeteries de la Chapelle, well-known French newsprint and magazine grade paper mill, operates an intriguing 20 t.p.d. capacity continuous cold soda pulp mill. Equally intriguing is the investigation being conducted to determine the potentials of a radically new wood chipping machine which produces crushed, uncut chips. Moreover, the crushed chips are produced in the forest, near by to the actual logging sites. The resulting chips, called "cloven chips" or "PP chips," are then compressed and wire-tied into bales—also in the woods—by another machine, a process which simplifies handling and shipping problems.

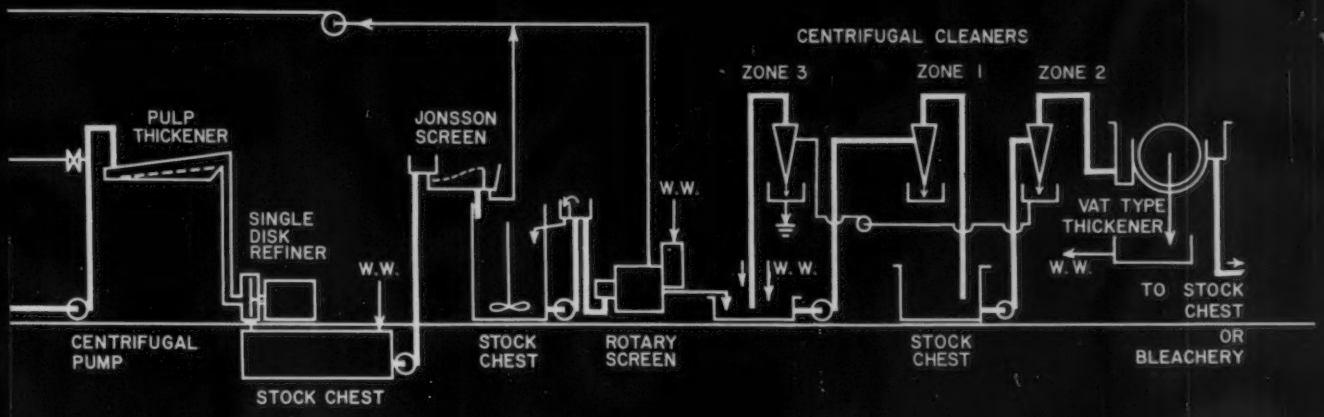
There are still two additional noteworthy facets to the La Chapelle story. One is the development of a new fiberizing mill, designated the "CCM Fibrator." This equipment was especially designed by La Chapelle for its cold soda mill. The second aspect is the use of a special rotor pump which is capable of transferring an aqueous suspension of PP chips in addition to providing a fiberizing action.

Papeteries de la Chapelle is located close to the river Seine, in the small community of St.-Etienne-du-Rouvray, just a few miles from the northern France city of Rouen. The mill was founded in 1928 and it has a record of consistent and prosperous growth. The mill today has five fourdrinier machines and it produces between 600-650 tons daily. Its main production (approximately 60 per cent) consists of newsprint, while the remainder is divided about equally between coated and uncoated magazine papers.

Of particular note among La Chapelle major equipment is No. 5 machine, a modern Beloit unit. This machine is 307 inches wide and it operates in the range of 2,000 f.p.m. It produces 300 tons of newsprint daily, meeting approximately 50 per cent of the mill's total tonnage.

Les Papeteries de la Chapelle, S.A., is closely connected with a sister mill, Cellulose de Strasbourg, S.A. Control of the two French companies was acquired early in 1960 by Bowater Europe S.A. Both companies were formerly held by St. Moritz Holding Co. of Zurich, Switzerland. (Bowater announced recently that they have offered to acquire all the outstanding shares in the two firms.—Ed.)

Jean Arguillere is general manager of the La Chapelle mill. Mr. Arguillere worked out the actual details of the mill's cold soda pilot plant and it was he who dubbed the pulp made by this process "Chemiurgical Pulp". He also initiated the



investigation of the possibilities offered by the new in-the-woods chipping method. Pierre Glize, development manager, and Marc Boisgontier, pulp superintendent, are Mr. Arguillere's special assistants for the cold soda pilot plant work. Jacques Reiser is mill superintendent. Charles Amiet is the commercial director for La Chapelle.

Buys Russian Wood

Papeteries de la Chapelle has its own groundwood mill, rated at 300 t.p.d. maximum production which is used primarily in the mill's magazine and coated paper grades. The remaining groundwood pulp requirements are imported mainly from Sweden and Norway. In its own groundwood mill, La Chapelle uses approximately 60 per cent Russian wood; almost all of it is spruce. The company is quite satisfied with the Russian pulpwood and considers its quality to be quite high but does occasionally experience delivery difficulties. Purchasing Russian wood is an "interesting economic proposition for La Chapelle," superintendent Jacques Reiser told this writer, but he declined to elaborate his statement with actual figures.

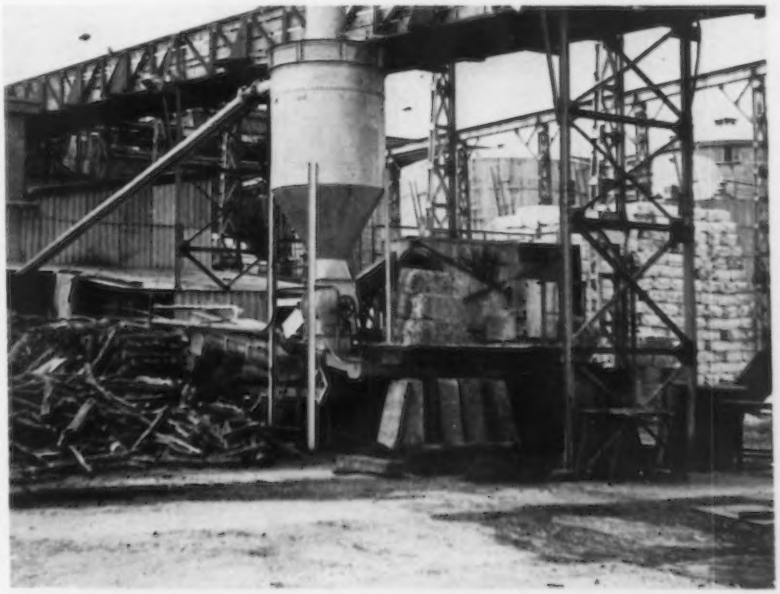
For its chemical pulp needs, La Chapelle turns to Cellulose de Strasbourg and also to almost all of the world's markets. A portion of her requirements for bleached and semi-bleached kraft is purchased from the United States and Canada. Other chemical wood pulps are purchased in Finland, Russia and from various standard Scandinavian sources.

La Chapelle's newsprint production goes almost exclusively to a French newspaper combine. Coated and uncoated magazine grades are sold on the open market, mainly in France.

Match-Size Chips

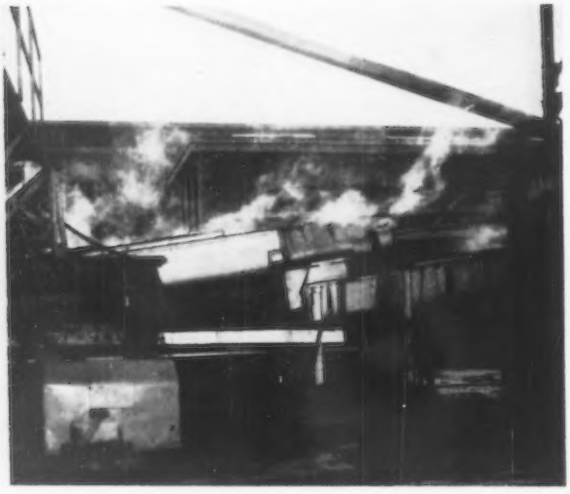
The "PP chips" with which La Chapelle has already run numerous cold soda trials, are most unusual in appearance. The wood has been, in effect, shredded, or cloven, by crushing it to produce match sticks. The machine which produces the PP chips is portable and relatively small. It can be easily moved about in the woods, rather effortlessly following the logging operations. To produce its unique chips, the machine uses logs cut to approximately one-foot lengths.

In the machine, the green logs are subjected to a type of crushing and rolling action. There is no cutting whatsoever. The action is likened to steel rolling in which a series of metal rolls progressively compress the ingots and thus thin them out. Similarly, the wood is also passed through a series of metal rollers and as these and their nips progressively diminish in size, the wood is crushed and squeezed into progressively smaller chips. The logs are fed into the machine with the bark intact. Debarking occurs initially and effortlessly because the machine is working with freshly cut wood containing green bark. The resulting PP chips vary in size from one inch to



EXTERIOR VIEW of pilot plant, at chip-feeding point. In center is storage silo for conventional wood chips. Bales of PP chips can be seen on platform to right. Portion of first inclined cold soda soaking trough is visible in left background.

BALES OF PP CHIPS can be handled just like bales of pulp. Here a fork lift truck picks up nine bales of chips.



PARTIAL exterior view of inclined cooking troughs.

five inches in length with the average length generally about three inches. The chip diameter varies between 0.04 and 0.12 inches.

The PP machine now in use is equipped with four pairs of crushing rollers. The first pair is deeply grooved which helps to remove the bark. The first two rollers are driven by a 25 h.p. motor; the others by one 15 h.p. motor for each set.

Baling—Also in the Woods

After the PP chips emerge from the cleaving machine, they are "combed" in another portable machine. This unit is equipped with a series of comb-like steel spikes which tend to pull the PP chips apart and thus help further in reducing their diameter. After the PP chips are passed through this combing machine, they are pressed and baled at the logging site. According to one La Chapelle spokesman, the idea is now to build one machine which will combine all these features into one unit; i.e. a machine which will debark and cleave the wood, comb and finally press and bale the chips, all in one automatic operation.

In their present form the PP chips are baled with common baling wire, producing surprisingly compact bales weighing between 110 and 130 pounds. The bales are about 28 inches long, 28 inches wide and 16 inches deep. Baling is a re'atively easy operation and there is little loss during subsequent handling and shipment because the rough, partially defibered physical condition of the chips makes them tend to adhere loosely to each other.

On receipt at the mills, the PP chip bales are stored in the open mill yard, close to the pilot plant buildings. The PP chip bales are handled with conventional fork lift trucks, just like pulp bales. About nine chip bales are handled by one truck at one time when it moves them from the storage yard to the cold storage plant feeding platform.

The PP chipping process was invented and patented by Pierre Petit, director of a French company, known as S.E.T.A.F., of 43 rue Baubourg, Paris.

The experimental work with the PP machine is currently continuing in the woods surrounding the town of Marreuil-les-Meaux, where S.E.T.A.F.'s shops are located. Two more PP chip-producing machines are under construction at the present time. These will be production units rated at 20 tons per nine-hour operating day, when working with 50 per cent moisture content wood.

Cold Soda Pilot Plant

La Chapelle's cold soda plant, where these chips are pulped, has a daily production capacity of between 15 and 20 tons of air dry pulp. It is operated in three shifts and although all of the pulp it produces is used by the paper mill, it is still primarily an experimental operation. There is a great variety of experimental equipment and the pulping variables are frequently changed. Nevertheless, the plant is operated so successfully that the majority of its production can be used for the mill's regular newsprint grade. An indication of the extent of the research is that five different refiners, five types of conical centrifugal pulp cleaners and 11 different wood species and types of

chips (PP chips among them) have been investigated.

The plant's cold soda open-type soaker can be supplied with raw material from two separate sources. One of these is a conventional chipper installation which is also a part of the pilot plant. The second source of supply is a special but simple chip feeding arrangement for utilizing the PP chips.

As stated, the PP chips arrive at the mill in bale form. These bales are deposited on a special platform, are unstrapped, and the chips are then fed into a chest equipped at the bottom with spiked rolls. These rolls tend to "comb" the chips and thus reduce their tendency to clog. After passing through the spiked rolls, the PP chips drop into a chest where water is added to produce a slurry of four to five per cent consistency.

Special Rotor Pump

This chip suspension is then passed through a special pump equipped with a rotor which provides further fiberization of the chips. This pump is "absolutely essential" in this process according to a mill spokesman. Its propeller consists of a steel plate which moves against a grooved rotor, producing a combined cutting and pumping action and is powered by a 20 h.p. motor. This special pump (see accompanying drawing and photograph) is supplied by Baudot Hardoll, 97 Boulevard du Port-Royal, Paris.

An interesting side light on this equipment is that La Chapelle believes it has found another very promising use for the pump. In its groundwood pulp mill, La Chapelle has attempted to pass full screen rejects through the Baudot Hardoll pump rather than to return the rejects to the grinders. Experimental work with this idea is continuing

Pierre Glize,
La Chapelle developments director

and preliminary findings indicate that this pump can be used to reduce these rejects to nearly the size of fine screen rejects which are then reduced in a disk refiner.

Returning now to the discussion of the pilot plant: The B-H pump moves the PP chip suspension into a flowbox which has overflow provisions. This stage is necessary to provide a constant flow to the caustic soaker which is operated on a continuous basis.

Overflow from the flowbox is re-cycled to the pre-pump chest. Between the flowbox and the soaker is a perforated plate which acts to thicken the slurry to approximately 15 per cent consistency. The water thus removed is also recycled to the pre-pump chest.

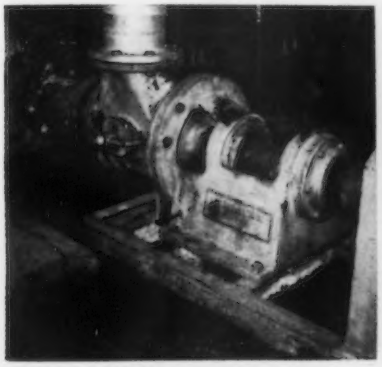
The actual cold soda soaker consists of three inclined screw conveyors so arranged that their discharge spouts feed down directly into the input spout of the succeeding conveyor. Sodium hydroxide is added to each conveyor at atmospheric pressure. Excess liquor is collected through a series of slotted plates at the bottom of each of the three screw conveyor troughs and is passed in to liquor recirculating tank. Liquor for the first impregnation stage is supplied from this tank. Caustic for the second and third stages is freshly made. Steam is added to the second and third stages and pulp temperature is maintained at approximately 115°F.

As other cold soda mills have experienced, the use of a match-size chip in the soaker has resulted in faster, more complete impregnation with lower caustic consumption. Thus, at La Chapelle, 20 minutes is the usual time necessary for the rough-surfaced and partially-defibered PP chips to pass through the soaker as opposed to 40 minutes required for conventional chips. Speaking in approximate terms, caustic consumption by the PP chips has averaged eight per cent (based on the weight of air dry wood) as compared to ten per cent by the conventional chips. There are also important savings in power consumption because of the smaller chip, especially in its refining.

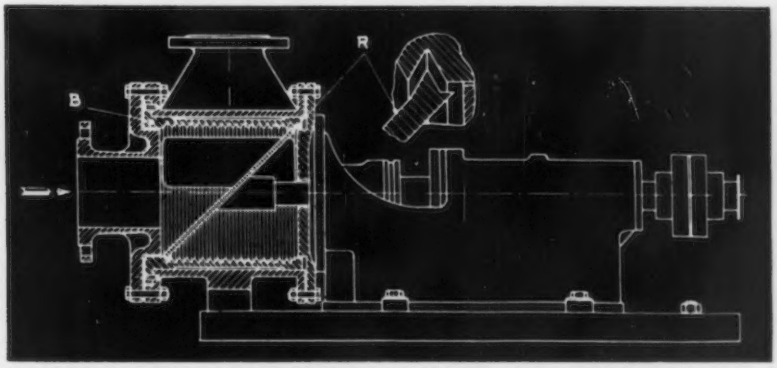
Emerging from the third screw, the pulp drops into an agitated chest where fresh water is added to produce a consistency between five and six per cent. From this chest, the pulp is pumped (by another B-H rotor pump) to a constant-level flow box.

Special Fiberizer

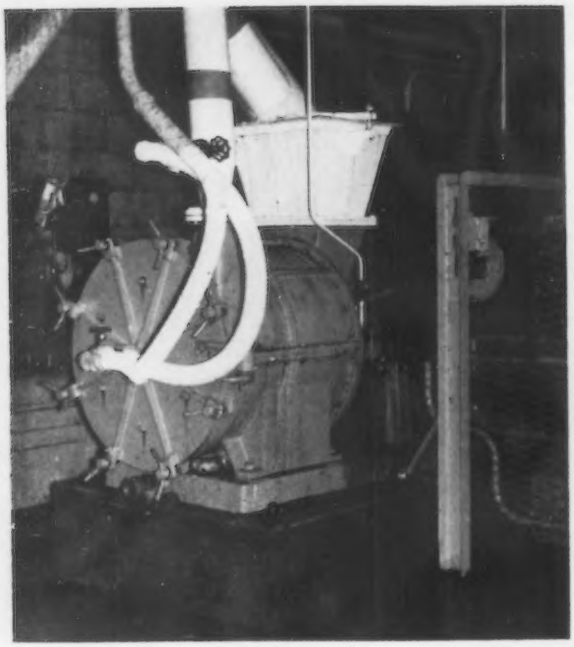
The next piece of equipment, called the "CCM Fibrator" bears especial importance to La Chapelle's cold soda pulp mill. Of mill manager Arguillere's own design, one is tempted to call it a "combination grinder and refiner." The machine consists of a stationary stone ring in whose center a four-bladed propeller revolves at speeds up to 1000 r.p.m. Upon emerg-



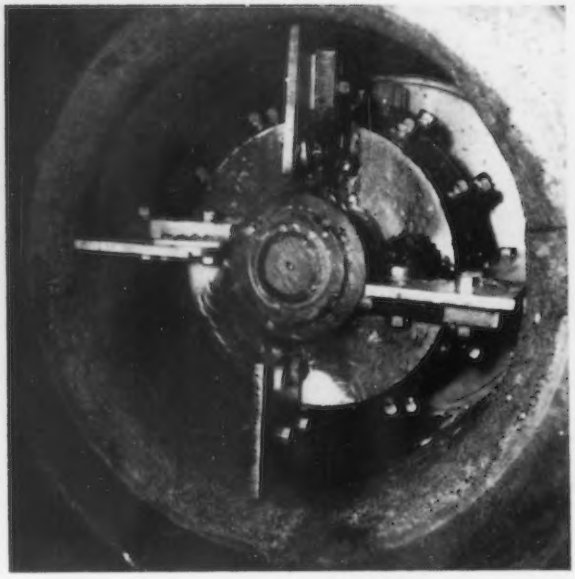
SPECIAL B-H ROTOR pump handles aqueous suspensions of PP chips.



CUTAWAY OF B-H PUMP shows relation of adjustable steel plate and grooved rotor which produces a combined cutting and pumping action.



VIEW of a closed La Chapelle CCM Fibrator.



CLOSE-UP of Fibrator's interior indicates sharpness of propeller blades and their clearance from the stone ring.

ing from the fiberizer, the pulp passes through a perforated screen whose holes are approximately one-eighth inch in diameter. The CCM Fibrator subjects the chips to a relatively gentle mechanical treatment. In it the chips are fiberized by being rubbed against the inside of the circular grinder-type stone. Although the high-speed propeller blades inside the fiberizer are equipped with relatively sharp edges, they do not subject the fibers to an excessive cutting action. Although the CCM Fibrator has been patented by La Chapelle, work on developing it further, continues. Mr. Arguillere told this writer he is very satisfied with the excellent initial results obtained with this unit and its ability to perform this initial fiberizing before the stock is passed to the plant's standard disk refiner.

On emerging from the fiberizer, the pulp is again passed through a constant level flow box, and over another perforated screen into a second agitator chest. Liquid draining through the perforated plate is recirculated to the first agitator chest immediately following the soaker. Fresh water is added in this second agitator chest to produce a consistency of approximately four per cent. A conventional pump next transfers the pulp through a standard Sprout Waldron thickener from which it emerges at a consistency of six per cent into a 500 h.p. single disk Sprout Waldron refiner. La Chapelle finds that it needs to use it only to approximately 300 h.p. capacity when working with PP chips. After fiberizing, the pulp then drops into a storage chest where water is added to produce a three per cent consistency.

Screening and Washing

A Jonsson screen is next. However, this screen is ordinarily not used when PP chips are the raw material. Next a conventional pump passes the pulp to a constant level chest where mill white water is added. This is followed by a standard Trimbey rotary screen of the conventional type used in groundwood mills. On entering these screens the pulp is diluted to 0.7 per cent consistency with mill white water from the paper machines. Dropping into another chest, the pulp is diluted to a 0.5 per cent consistency and from there it is pumped to the plant's cleaning system.

Currently, La Chapelle uses two types of conical centrifugal cleaners: Bauer Centricleaners and Leje Thurne cleaners. However, quite a number of other cleaners have also been used experimentally during past work. The cleaners are arranged in two stages and are so connected that they can be used in various types of combinations with regard to primary, secondary and tertiary cleaning. La Chapelle has found that, in the case of PP chips, a smaller cleaning capacity is required than is experienced with conventional semi-chemical chips. This is another source of power consumption savings effected by the PP chips.

The "accepts" emerging from the cleaners are next passed to a conventional decker, emerging from this at eight to ten per cent consistency into a storage chest, ready for immediate use, or ready for bleaching. The La Chapelle pilot plant also includes conventional equipment for bleaching with hydrogen peroxide.

Looking to the Future

The La Chapelle cold soda semi-chemical pilot plant was started up three years ago. At that time, it began to operate with conventional wood chips. La Chapelle was already on the look-out for a type of chipping process which would produce chips in the woods, immediately after logging. However, although a number of other such processes were tried, none have come even close to the promising results obtained so far with the PP chipping process. One

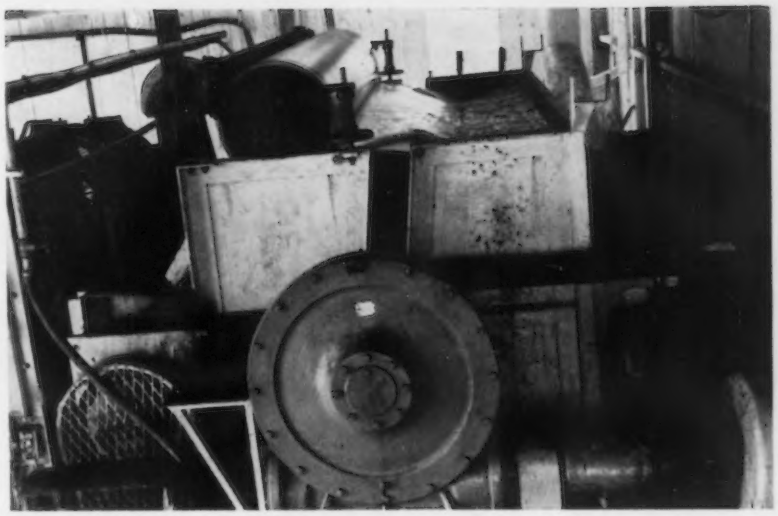
of the motivating factors in creating the pilot plant's cold soda semi-chemical approach (according to Mr. Arguillere) was the realization that these methods promise the maximum possibility for the utilization of deciduous species.

Looking ahead, Mr. Arguillere is now considering the possibility of investigating a type of "chemical pre-impregnation" of the PP bales. Here he has in mind the interesting possibility of perhaps sprinkling or spraying the PP chip bales with a weak liquor right in the woods, either immediately before or after baling. Pre-impregnation would thus take place during the period of transportation from the forest to the mill and during storage in the mill yard.

Generally, it can be said that the pulp produced from PP chips with La Chapelle's cold soda semi-chemical process is rather conventional. Compared with mechanical pulp of equal freeness, it can be said that the PP pulp's mullen, breaking length and folding resistance are better, that tearing strength is about equal and that both opacity and brightness are somewhat inferior. With regard to printability of papers made with this pulp, the mill still declines to make definite statements, except to say that printing is superior to papers with mechanical, high resin-content pulps.

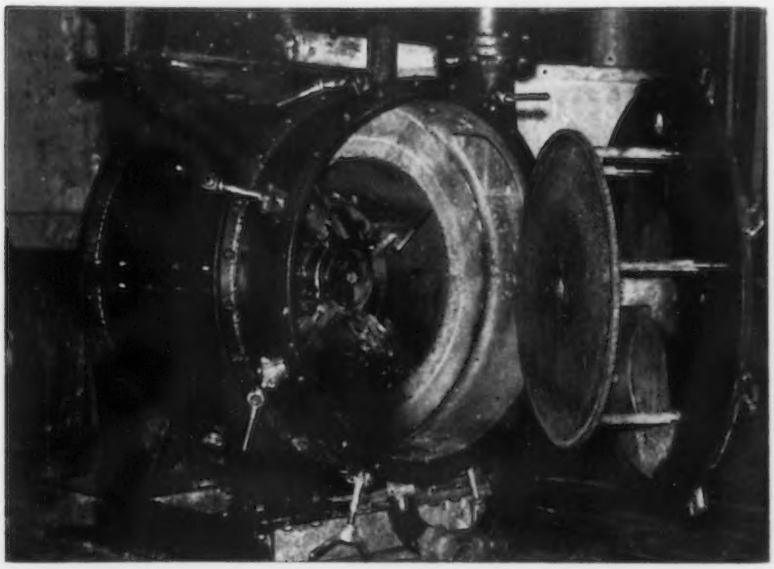
La Chapelle stresses at this time that results obtained with the PP chips in its pilot plant are difficult to report at this stage because of the fact that the operation is *indeed* a pilot plant. Nevertheless it can be said generally that PP pulps always produce tensile strengths substantially higher than identical pulps produced from conventional chips. This is true for all PP pulps produced in this plant so far. It has also been found that Schopper-Riegler freeness is approximately 44° with pulp produced from PP chips compared to an S-R freeness of 60° for identical pulp from conventional chips.

In the matter of yield: with this pilot plant operation La Chapelle has reached yields of approximately 75 per cent (on air dry wood) with the use of conventional chips. Indications are now that the yield figure is about 80 per cent with PP chips. Mill spokesmen are again however quick to add to this that these figures are merely based on pilot plant trials and these yield figures of course depend on the usual variables. Birch and poplar appear to give the best yield, results so far show. The majority of the work done with the PP process has so far been primarily concentrated on studying poplar. This has been done principally to standardize at least one variable in the subsequent pulping studies. However, the idea is to use all species found in French forests. A few other wood species trials have, however, already been run. These showed rather conclusively that poplar tends to give most satisfactory results, especially from the standpoint of color. This is an important consideration because the aim is to produce poplar cold soda pulp (with the PP chipping process) without bleaching and to produce a brightness which will make the pulp usable for newsprint grades in its natural, unbleached state. According to Mr. Glize, poplar wood prepared with the PP chipping process results in a Photovolt brightness of 56, without bleaching. Mr. Glize believes that this unusual brightness (compared with a Photovolt brightness of 40 when conventional poplar chips are used) is due to the debarking quality and the degree of fiberization (or shredding) achieved in the PP machine. La Chapelle now incorporates the production from its cold soda pilot plant into its newsprint grades run on machines four and five, sometimes using as much as 12 to 15 per cent "PP pulp" in the furnishes.



FINAL WASHER following stock cleaners.

OPEN CCM FIBRATOR shows high-speed four-blade propeller which revolves inside stone ring. Attached to open door at right is screen plate through which pulp passes as it leaves the fiberizer.



Fourdrinier Maintenance—Key to Machine Efficiency and Wire Life

How are these objectives affected by the condition of the fourdrinier's components? Here are some of the answers. What should be done about them: when the machine is running? when the machine is down?

J. E. Vercoe,
Staff Engineer,
Beloit Iron Works

Fourdrinier maintenance is easy to neglect as long as the machine is running smoothly and wires are holding up. To keep the machine operating efficiently, and to prevent unscheduled shut downs, requires a regular maintenance procedure plus constant surveillance for symptoms of malfunction.

Good fourdrinier maintenance requires minute attention to many small and varied details. Some of the major items are:

- Mechanical condition of parts
- Roll coverings
- Surfaces of wireboxes, forming boards, deflectors
- Alignment of machine components
- Corrosion prevention
- Cleanliness

No one needs to be persuaded that an improvement in machine efficiency or longer wire life is desirable. In the following paragraphs, we will show how these objectives are affected by the condition of fourdrinier components. To make our presentation more graphic, we will discuss the fourdrinier components in the order in which the wire contacts them.

Breast Roll

The alignment of the breast roll is of first importance to a true running wire. Because of its heavy wire wrap, the breast roll, along with the couch roll or wire turning roll, is more potent in guiding the wire than the other components on which the wire rides.

If the breast roll is not raised properly, a strain can be placed on the raising arm and the resulting distortion of this arm can change the alignment of the forming board. Figure 1 shows the type of breast roll raising arrangement in which the breast roll is raised by a gear unit driving a cross shaft on which are mounted pinions which engage gear segments on the raising arm stub-shaft. With this type of raising arrangement, the breast roll arm should be raised until there is approximately a 1/16 inch gap between the raising arm and the stop on the wet end support stand. The arm should be raised the rest of the way by tightening the swing bolts on the support stand. If the arm is raised by the gear unit until the arm comes up against the arm on the support stand, a strain is placed on the arm. Because the gear unit (in many cases) is a double worm self-locking unit, the resulting distortion in the arm and alignment of the forming board remains until the next time the breast roll is lowered. This may explain why the flow looks good at the forming board when the fourdrinier is in operation, and, on the next wire change, the flow looks entirely different. To keep the flow characteristics over the forming board consistent, the breast roll should be raised in the same manner after each wire change.

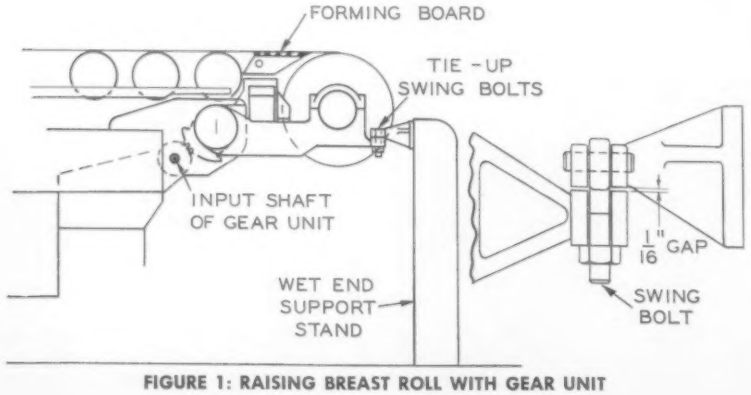


FIGURE 1: RAISING BREAST ROLL WITH GEAR UNIT

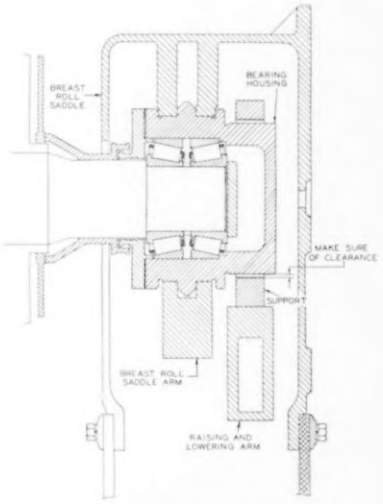


FIGURE 2: PROPER RAISING OF SHAKING BREAST ROLL

Shaking breast rolls require checking to be certain that the breast roll bearing arms have been pulled all the way up into the breast roll saddles. From Figure 2, it can be seen that the breast roll must be raised by the breast roll saddle arm until the

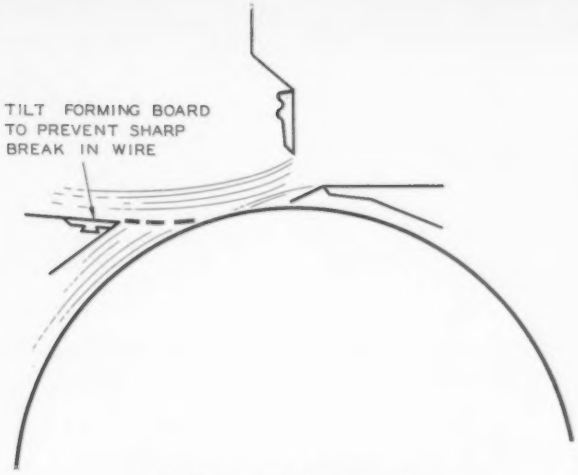


FIGURE 3: TILTING FORMING BOARD TO ACCOMMODATE WIRE

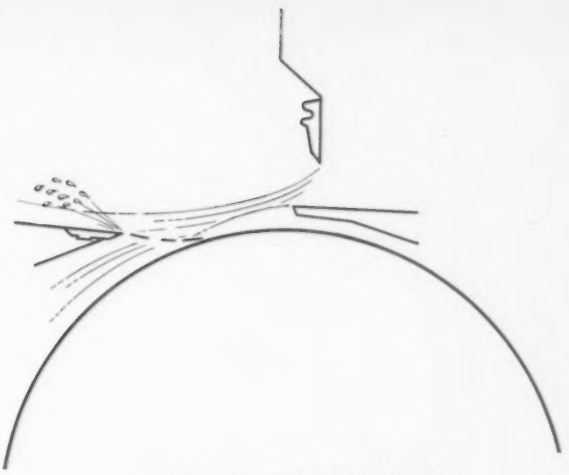


FIGURE 4: DISTURBANCE TO FLOW FROM DAMAGED FORMING BOARD TIP

bearing housing is lifted off of the support on the raising and lowering arm. The necessary clearances are set up in the initial installation of the breast roll, but, to obtain these, both the breast roll raising arm and the arm on the breast roll saddle must be raised against the stops.

Forming Board

The primary purpose of the forming board is to support the wire between the breast roll and the first table roll. The wire sags following the breast roll because of the pumping action of the breast roll. On some grades of paper or board, this pumping action is necessary to assist the water removal in the forming section. If this is the case, the forming board should be tilted as shown in Figure 3 so that the wire does not break sharply over the forming board tip. On other grades where the optimum in fiber retention is desired, the forming board tip should be set as close to the breast roll as is possible without jamming up the water removed at this point.

In any event, some of the discharge from the slice splits off at the forming board. In order to divide the flow cleanly, the forming board tip must be sharp, and free from nicks. Damage to the tip comes either from handling or from walking on it. If the forming board tip has been damaged or worn unevenly, the forming board should be removed and ground while supported on its own journals so that the normal deflection is taken into account. Figure 4 illustrates the disturbance to the flow on the wire caused by a damaged forming board tip.

Table Rolls

Table roll surfaces should be kept clean. This is particularly true of grooved rolls where stock accumulation can throw the rolls out of balance, or defeat the purpose of the grooved table roll which is to break the suction at the off-going wire nip. Table roll surfaces, therefore, should be hosed off thoroughly before a new wire is mounted.

Micarta covers on table rolls may wear unevenly leaving high spots which wear on wires. Rubber covers may blister from corrosion at the surface of the metal core. Rolls should be re-covered when necessary.

Misalignment of table rolls is indicated when the wire runs to the front or back side when the stock is put on the wire and runs to the opposite side when the stock is removed.

When bringing the table rolls into vertical alignment, the check should be made by "gap" rather than by contact as shown in Figure 5 (a) and (b). If the table roll is brought up into contact with the piano wire, there is a tendency for each successive table roll to raise the piano wire a little higher as shown in Figure 5 (b).

In squaring the table rolls, the important thing is to set each roll in relation to the centerline of breast roll rather than the adjacent roll. This can best be done by clamping a tape to the apron lip at the slice. Pull the tape with a tension scale, and set each roll to the desired spacing, using a scale and centerhead on the journal. To square the rolls, use the same procedure and tape on the back side of the machine.

Deflectors

On high speed paper machines, the wire requires support after table rolls where the pumping action is heavy. The flat top deflector shown in Figure 6 supports the wire and performs the same function as the forming board. It follows that the same precautions against damage to deflector tips should be followed. Also, grind the surface of the deflector when required to prevent damage to edges of the wire.

Wire Suction Boxes

The friction between the wire and the surface of the flat boxes constitutes the major load on the four-

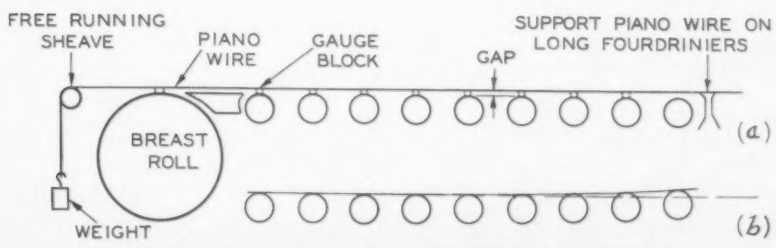


FIGURE 5: SETTING VERTICAL ALIGNMENT OF TABLE ROLLS

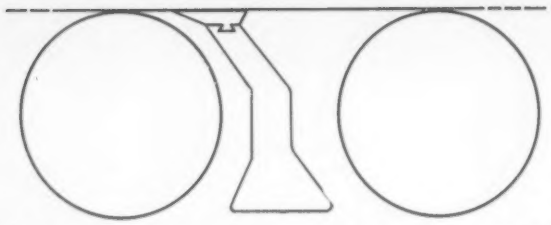


FIGURE 6: SUPPORTING WIRE WITH FLAT-TOP DEFLECTOR

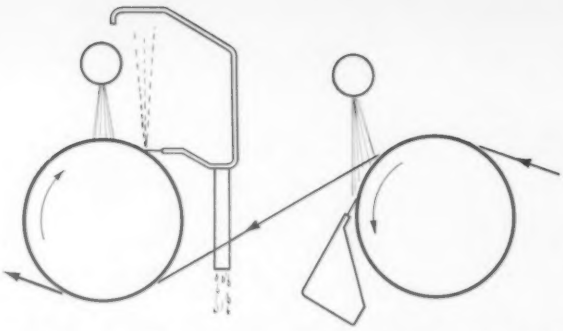


FIGURE 7: MOUNTING SHOWERS AND DOCTORS ON WIRE RETURN ROLLS

drinier drive. It follows that it is the major source of wire wear. Our aim should, therefore, be to keep the flat box covers as smooth as possible, first, by keeping the covers moist during shut down to prevent warpage, and second, to keep the wire from grooving the covers by either oscillating the boxes or the wire.

Wire friction can also be reduced by the choice of appropriate materials for flat box covers. There are many new materials on the market which have a lower coefficient of friction than the conventional cover materials such as Teflon, nylon, PVC, silicon carbide, polyurethane, etc. Some mills are reporting considerable improvement in wire life by the use of these materials. However, these materials must be properly selected to suit mill conditions.

Embedded grit in wire box covers has been a cause of short wire life. Flat box covers should be examined for embedded grit or sand, and if found, performance of stock cleaners should be checked.

Couch Roll

The friction between the couch roll shell and its suction box packing strips can consume a considerable amount of horsepower. This friction can also cause difficulty in starting up the fourdrinier. To keep the friction load at a minimum, the packing strips should be free from binding and the friction surface lubricated with water. The packing should be checked for freeness when the suction box is removed from the shell by depressing the packing to see that there is no binding and that there is resiliency in the response. A fog shower helps to reduce the friction between the suction box packing and the couch shell.

Water is used to lubricate between the packing surface and the side seals. To keep the packing from seizing due to excessive water pressure, the supply pressure to lubricating lines should not exceed 15 p.s.i.

When the suction box is removed from the shell (which should be at least once a year), the couch roll bearings should be checked and the back internal bearing lubricated. This bearing can be lubricated while the couch is running, but you cannot tell how much grease is getting to the bearing. Furthermore, there is a danger of over-greasing and the excess getting onto the sheet. If the back internal bearing is checked and repacked annually with a good grade of water-resistant grease, greasing in the interim is not necessary.

To keep the holes open in the couch roll shell, the flushing shower should be turned on when the sheet is off the machine and before the machine is shut down. Flushing periodically with detergents is helpful in many cases. When the suction box is removed from the shell, the shell holes should be cleaned out, drilled if necessary. High pressure showers (800-1000 p.s.i.) are used periodically by some mills. Sometimes this shower is permanently installed adjacent to the outer surface of the roll on the inside of the wire run, and is turned on periodically during operation of the machine.

The couch roll and wire turning roll can get out of alignment because of play between the keys and keyways in the remover blocks. These should be examined on every wire change.

Turning and Return Rolls

The surfaces of the wire turning roll and wire return rolls must be in good condition to prevent damage to the wire. Metallic surfaces should be free of nicks and grooves. Rubber covers should be replaced if blistered.

The alignment and levelness of these rolls is important because of the grinding potentialities of these rolls.

The structural rigidity of these rolls should be sufficient to withstand all probable wire tension forces. Otherwise, high wire tensions may cause excessive deflection of the rolls. This results in wrinkled wires.

Showers

An efficient shower system is essential to wire life because there is always present the danger of stock getting between the wire and the wire return rolls and causing ridges.

The showers which knock the trim or sheet off the wire must be in good working order, and the pressure supply, dependable. Trim and sheet wetting showers should be used before the knockoff showers.

A wire cleaning shower is frequently located above the first outside wire return roll. This shower should be of the high pressure jet type, and should be oscillated.

On the inside wire return rolls, the showers play on the axial centerline with a doctor following the shower as shown in Figure 7. The doctor must have a saveall for collecting the doctored material, and downspouts which drain outside the wire. The doctor should have a generous guard to protect the wire from any throw-off from the doctor blade.

On the outside wire return rolls, the showers wash the wire as well as the roll, (see Figure 7). These showers are generally interchangeable with the inside roll showers, and operate at the same pressure. They should be spaced closer to the wire for effective cleaning.

The shower pipes should be cleaned out frequently to prevent any encrustation from interferring with a uniform spray pattern.

At the breast roll, a shower should always play on the underside of the apron cloth to keep strings from forming and to lubricate the end of the cloth. A worn apron cloth should be replaced before its effect can be observed in the sheet.

Showers can become a menace to wire life if the shower water is not

filtered. A piece of grit between the wire and a roll can cause a dimple in the wire which will wear into a hole. Indications are that considerably more wires have to be changed because of holes than have to be changed because of ridges.

The spray from the showers should be directed away from roll bearing seals as far as possible to prevent water contamination of the bearing lubrication.

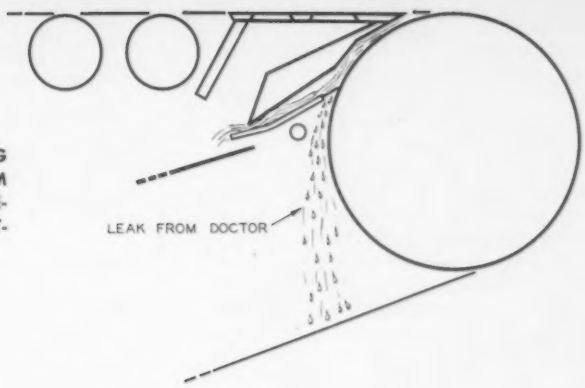


FIGURE 8: JAMMING OF WATER FROM BREAST ROLL BECAUSE OF RESTRICTED PASSAGE

Doctors

The purpose of the doctors, like the showers, is to protect the life of the wire.

An efficient breast roll doctor is very vital to wire longevity. Any stock falling onto the wire will be carried into the nip between the wire and the breast roll, and very likely cause a ridge. The doctor back or saveall behind the doctor blade should allow the unimpeded passage of the water removed at the breast roll so that the water will not jam up. If this happens, the doctor balance may be affected so that the doctor lifts up off the roll (see Figure 8).

Doctors should be oscillated to prevent scoring the surfaces of the rolls. If the doctor is not oscillating, it can be due to two reasons—the setting of the valves regulating the air supply to the diaphragms, or binding between the bearing housing and the outer race on the doctor journal. If opening the regulating valves to full open does not oscillate the doctor, there is binding between the outer race and the bearing housing.

We find that the most efficient angle for doctoring the fourdrinier rolls is 25 degrees. As the blade wears, this angle increases, and the blade should be replaced when the angle reaches 30 degrees to prevent damage to roll surfaces. A spare set of doctor blades should be on hand at all times.

Automatic Wire Guide

Guarding against failures of the automatic wire guide is a must. On air-operated guides, the air diaphragm should be checked for cuts, cracks, and wrinkles. On mechanically-operated guides, the surfaces of the dog blades which actuate the ratchet wheel should be true and sharp. Also, the surfaces of the pins connecting arms and forks should be in good mechanical condition.

The movement of the roll should be checked for freeness, there snould be no binding in any part of the mechanism.

Wire Tension Controller

One of the greatest aids to wire life and consistency in the quality of the sheet is the wire tension controller. The device shown in Figure 9 is a stretcher and wire tension controller combination. As shown, there is an air spring between the stretch roll arm and the raising arm. The raising arm floats on the stretch roll air cross shaft and raises the stretch roll arm by compressing the air spring against the force of the air pressure.

One of the important things to remember about this device is that the air spring is kept within its working range by the lift arm. When the length of the fourdrinier wire changes, the stretch roll establishes a new position which is determined by the balance between wire tension force and the air spring force. If this new position is outside of the working range of the spring, the first thing to do is to raise or lower the lift arm to set the spring at the operating position, *then* adjust the air pressure in the air spring for the new angle of the stretch roll.

Maintenance of this wire tension controller consists of checking the air spring for bulging, and that the extension of each air spring, front and back, is the same.

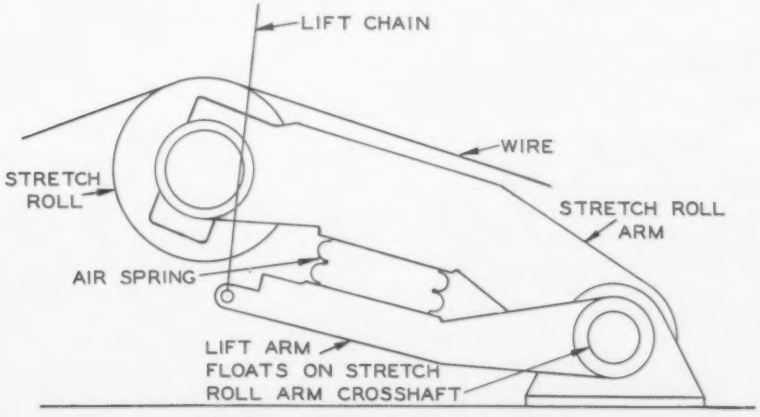


FIGURE 9: WIRE TENSION CONTROLLER

Roll Bearing Lubrication

The following are important points to keep in mind:

1. Use the type of grease recommended for wet end bearings.
2. Do not over-grease because housing cavities may become grease-packed and interfere with free running of lightly wrapped rolls such as table rolls.
3. The condition of grease in bearing housings can be determined by inserting a loop, made of soft copper wire, through the vent plug hole into the housing cavity and removing a sample.
4. Once a year, clean out bearing with solvent, such as kerosene, and repack.

Fourdrinier Shake

The bolts securing the clamping devices at each end of the micarta springs should be checked for tightness. This is important because, if the bolts are loose, the strain from

the bending of the spring will come on the notch in which one end of the clamp grips the spring.

The proper alignment of the fourdrinier shake is necessary to keep bending stresses on the shake springs at a minimum, and to insure long spring life. It should be determined that, when the shake units are at the center of the stroke, the table rolls and the breast roll are centered on the centerline of the machine.

The springs should be checked for permanent set and replaced if this has occurred.

Wire Changing Gear

Wire changing equipment should be in good condition so that the wire can be put on safely and without damage to the wire. The surface of wire poles should be smooth.

Required tools, slings brackets, and pins should be readily available because makeshift devices can be hazardous. The above equipment should be cataloged, and also, locked up between wire changes.

Condition of fourdrinier remover rails and gear wheels should be checked periodically, and surfaces cleaned.

Wire History

The prevention of damage and wear to the wire is an essential part of fourdrinier maintenance. A wire history or log is a valuable tool in maintaining the fourdrinier because it may point to the causes of wear or damage originating in the machine or in the stock system ahead of the machine. However, the wire log by itself is of little value. To find contributory causes, the complimentary records listed below should be available.

A wire log should include the following information:

a. Name of manufacturer
b. Mesh
c. Caliper, new
d. Date installed
e. Date removed
f. Reason for removal
g. Caliper, used—readings from several points across the wire.
h. Description of condition of wire when removed—i.e. ridges and indentations, holes and cracked edges, etc.

Complementing the wire log should be the following records:

1. Operating logs which show
   a. Speed
   b. Basis weight
   c. Machine settings
2. Record of machine maintenance.
3. Record of machine modifications.
4. Record of changes in other parts of the plant which might affect machine operation.

By working with records such as these, it is sometimes possible to find changes which resulted in loss of wire life.

TABLE I
Running Maintenance Items

Observe efficiency of:

- Trim wetting and trim knockoff showers.
- Sheet wetting and sheet knockoff showers.
- Wire cleaning and wire roll showers.
- Wire roll doctors and doctor savealls.
- Wire guide roll travel. If guide roll tends to stay away from centerpoint, adjust hand guide to bring oscillation back to centerpoint.
- Breast roll doctor and saveall.
- Wire tension—adjust if necesary.
- Table rolls—should be turning at wire speed.
- Performance of forming board and deflectors—raise or lower, as necessary.

Corrosion

One of the most insidious enemies of fourdrinier components is corrosion. Corrosion may be caused by moisture-laden air, chemical attack or galvanic action.

The simplest means of combating corrosion on iron and steel is paint. There are many excellent paints and coatings available which resist chemical attack.

The use of corrosion-resistant materials does not insure corrosion protection. A corrosion-resistant material may corrode due to galvanic action if it is in contact with another material to which it is anodic. For instance, certain aluminum alloys, when in contact with austenitic stainless steels, will corrode if an electrolyte such as fourdrinier white water is present. If such combinations are unavoidable, the anodic material should either be painted or the joint should be insulated. Also, stainless steel welds should be cleaned with a stainless steel brush to prevent galvanic corrosion.

In Summary

The maintenance requirements of one fourdrinier in one location may be different in several respects from a similar fourdrinier in another location. It is difficult, if not impossible, therefore, to set up a maintenance schedule which would apply generally. We have, instead, categorized the items discussed previously into running maintenance and down maintenance. These items are presented in Tables I and II.

TABLE II
Down Maintenance Items

Check the condition of:

- Adjustable slice lip and apron lip on the headbox. Both should have a high polish. If rubber apron cloth is used, check that apron cloth contacts wire evenly.
- Breast roll alignment.
- Forming board tip and its alignment.
- Table roll alignment. Wash down table rolls. Make sure that grooves are clean.
- Deflector tips and replace if necessary.
- Flat box surfaces. Regrind if necessary.
- Flat box alignment. Keep box covers moist during shut down.
- Couch roll. Remove suction box from couch roll annually and follow instructions of manufacturer on maintenance.
- Wire roll and wire cleaning showers and clean out.
- Wire roll doctor blades and their angle. Replace if necessary.
- Wetting and knockoff showers and clean out. Remove filters and clean.
- Breast roll doctor blade. Replace if necessary.
- Breast roll shower and clean out.
- Timing of flatbox oscillator. Be sure that stroke is centered.
- Fourdrinier shake alignment. Springs and bolts should be secure.
- Covers on all table rolls and wire return rolls. Recover when necessary.
- Lock screws on front side of couch. Make sure they are tightened before cantilevering, and backed off before starting up.
- Keys and keyways in removable block under couch and wire turning roll.
- All drive couplings and clutches for alignment, wear and lubrication.
- Wire return rolls for levelness and alignment.
- Dandy roll bearings and drive (if any).

Less Wire Wear! Teflon Suction Box Covers

Substantial advantages have been reported. Of importance is the method of bonding Teflon to substrate.

Robert L. Holmes,
Technical Director,
General Asbestos and Rubber Division,
Raybestos-Manhattan, Inc.

In recent years the mills have shown considerable interest in the use of Teflon as a suction box cover material for fourdriniers. This interest has risen because the low coefficient of friction of Teflon results in less wear of the wire and consequent longer life.

Maintenance of Teflon-faced boxes, which also is a prime consideration, can be almost negligible. Several boxes in use over a three-year period have required no resurfacing and the wear of the Teflon is hardly measurable. Periodic grinding of wood covers produced a greater loss due to grinding than wear. Laminated phenolics are subject to longer intervals between grindings and usually have longer service lives. Unlike wood covers, the laminated covers and the Teflon faced covers do not have to be kept wet.

U. S. Patent No. 2,876,685, dated March 10, 1959, assigned to the Raybestos-Manhattan Corp., covers the manufacture, sale, and use of Teflon as a suction box cover material. Teflon-covered suction boxes are being used in ever-increasing numbers. We have found that the laminate, provided it has low water absorbing properties, when bonded with a low water absorbing adhesive, produced a satisfactory product. Laminates such as Westinghouse Micarta Grade 223 and our own special adhesives have produced some of the best results. Others also have been used.

A recent survey has been completed of 21 of the southeastern and southern kraft paper mills in the United States. The majority reported definite advantages over a three-year period of using Teflon-faced covers. The most specific conclusion arrived at was that wire life was increased.

In these kraft paper mills an increase of wire life resulting in one less wire change per month per machine would pay for a complete set of Teflon covers in six weeks.

The increase in wire life is the direct result of lowered friction between the wire and the cover. Teflon has the lowest coefficient of friction of all known organic materials. Lowered frictional values of metal against Teflon should result in less wire wear and lowered power consumption.

The chief cause of wire wear is thought by many to be the result of contact between the wire and the suction box cover. The installation of just one Teflon-covered box has produced greatly increased wire life and lowered power consumption.

Determining Wire Life

The determination of wire life is a difficult process due to the many variables involved. One method has been to average the actual days of use, eliminating those in which the wires are mechanically damaged. A better method is that of gauging the wire before installation and upon removal. The loss in gauge divided by the number of days in use multiplied by seven produces a figure of wear for a seven-day period. The results obtained at one mill using both methods of wire life measurements are shown in Table I. By either method the use of Teflon has shown improved wire life.

TABLE I WIRE WEAR RESULTS

	Months of Test	Days Wire Life	Inches Wear Per Seven Days
Control—No Teflon	5	4.94	.0079
One Teflon Box	9	6.04	.0068
Two Teflon Boxes	3	6.02	.0064
Three Teflon Boxes	1½	—	.0062

This machine was 256″ wide Fourdrinier producing heavy kraft and board and had 10 boxes.

Power consumption as affected by suction box covers can be also measured. Only the most accurate comparison can be made under the same set of operating conditions with and without Teflon covers. In one set of experiments the suction is turned on and off and power consumption measured on a Teflon covered box and boxes not covered with Teflon on either side of it. One very large mill estimated a savings in power consumption of between 20 to 30 per cent.

Choice of Adhesive Important

The proper choice of adhesive and the bonding methods are rather important. An adhesive that has a low degree of water absorption, when tested in white water, produces longer lasting bonds in use. A second method of determining the life of the bond obtained between the Teflon and the substrate is obtained by testing the shear strength.

Preliminary findings indicate that low water absorbing laminates are desirables. Adhesives should definitely show low water absorption. Additional tests of this type are being continued. Studies of the adhesion loss compared to white water source are being made.

Bonding of the Teflon to the substrate is best accomplished at temperatures in the range of 70 to 140°F. Bonding at higher temperatures such as 300°F. or higher result in built in strains or stresses between the Teflon and the substrate. This is due to the differences in the linear coefficient of expansion between the Teflon and the substrate. These differences in thermal expansion create stresses which can result in failure in the glue line. This is especially true with the thicker Teflon covers and with adhesives requiring elevated temperatures to obtain cures.

The Teflon face is preferred by most mill operators as a single unit. The thickness preferred appears to be one quarter of an inch. This allows for truing up the box before installation on the suction box itself. Thinner Teflon sheets such as one eighth inch are not thick enough for this original facing or grinding operation. The substrate is generally trued up before applying the Teflon to minimize final grinding for leveling. There is some indication from on machine tests that the thicker covers wear less.

What Are the Vital Factors in Tissue Felt Operation and Life?

Felt application to tissue manufacturing and problems met were explored at Albany Felt Co. Round Table.

Felt design factors affecting water film-carrying ability, and "break-in" time for pickup felts were among major topics covered by tissue mill superintendents and felt manufacturing specialists at Albany Felt Co.'s recent Tissue Round Table. The two-day session at the Albany, N. Y., plant attracted 24 mill operators from across the nation, representing mills producing approximately 30 per cent of the total tissue production in the United States. Larry Woodside, chief engineer, Technical Field Service at Albany Felt, moderated. Planning was developed by James E. Smith, now vice president and general manager of Albany Felt. Co. of Canada, Ltd. Other participants were: Everett C. Reed, executive vice president, Harold F. Hedberg, vice president, research and development, S. Stuart Engle, technical director and H. J. MacMillan, director of product design. Also, Carl C. Gordon and J. S. Sweet, chief chemist and asst. chief chemist respectively, and James H. Garofalo, service engineer.

Water Film Carrying Ability

In answer to questions from the floor relating to (1) felt design factors affecting water film-carrying ability and (2) how can better pickup be accomplished with less water, Albany Felt specialists said these two questions are related.

It has been proven a felt with greater bulk is more absorbent. This works to eliminate the surface water film necessary for best pickup. Design department personnel said it was necessary to make a thin, lighter weight, yet dense felt in order to retain the water film on the surface essential to best operation. It was further stated that a series of tests made at a large Southern mill show the thinner, harder felt will use considerably less water with good results. Where water supply is a critical factor, then a thinner, harder felt must be built.

This type of pickup felt, developed primarily by the Albany Felt Co., has been so successful that in the European market, where it is currently in use, it is referred to as the "American Type."

Start-up Times

A mill manager asked for an explanation of start-up times for a pickup felt. "Is the allowable break-in time eight, 16, 24 hours, or two days?" he queried.

A superintendent from a Middle-Atlantic area mill reported, "It is rare when it takes 24 hours for a new pickup felt to get up speed. In most cases it requires from eight to ten hours to attain maximum speed. Of course, operators would like to start up immediately at their highest speeds, but even if they had a felt that could do this, adjusting the machine correctly would still take from one to four hours."

During the review of start-up speeds, the practice of changing bottom felts when a new pickup felt is installed was considered. Most operators, it was learned, find it necessary to change a bottom felt if it is more than three or four days old. There are a few who do not change the bottom felts at this time, but they are very definitely in the minority.

Another questioner asked why pickup felts fill up in a non-uniform manner. It was said the probable reason is because they are too bulky and carry too much water in the body of the felt. This belief is based on the assumption that other conditions on the machine are correct. If this is the case, then it is necessary to make a thinner, denser felt to reduce the non-uniformity of fill-up.

Causes of Edge Wear

Tissue mill operators evidenced interest in the basic causes of edge wear on both the pickup felt and on bottom felts. Pickup edge wear was declared to be caused by the crown of the pressure roll, or that of the Yankee. The higher temperature of the Yankee dryer outside the sheet area probably contributes to the wear, it was said. Suggested cures for this problem are proper dubbing of the pressure roll or use of less weighting.

In the case of the bottom felt, one of the causes is excess water on the machine outside of the sheet edge. Attempts have been made, it was pointed out, to correct this condition by roll dubbing and by step-cutting the rolls.

It was agreed that the edge wear caused from a dubbed roll is probably from rubber flow at the points where the dubbing takes effect. This can be discovered by a very careful check of the crown of the rolls. One of the other cures mentioned was to drill the suction roll beyond the suction area, thus giving the water a place to go as the felt runs through the press.

There was considerable discussion of the pattern of drilling of a drilled pressure roll, as compared with a suction pressure roll.

It was stressed there should be as much open area as advisable, depending upon the construction of the roll. One of the dangers of a drilled pressure roll, particularly on a dense sheet of paper, is that there is a possibility of shadow marking from the holes in the roll. The consensus was that the benefits from the drilled pressure roll are that the holes give a place for vapor or water to go under the pressure of the nip.

Causes of Blowing

In answer to a question from a Wisconsin mill concerning the causes of blowing at the Yankee pressure roll, Albany technicians said there are two types of blowing. One is that on a new pickup felt, while the other is on a felt which has been broken in.

On a new felt, the phenomena is caused by air in the felt accumulating between the felt and the sheet of paper. This is corrected as the felt ages and becomes compressed. Therefore, it can be eliminated by making a felt thinner in the first place.

Blowing, as a felt gets old, is caused by its loss of water absorption ability. It has not, as yet, been proven—but it is thought there is water vapor which accumulates between the felt and the sheet, causing the sheet to leave the pickup felt in spots.

Effect of Felts on Speed

The mill managers asked: "How and to what extent do felts limit speed by: poor pickup, blistering, poor drying, poor crepe, and drop-offs?"

It was reported the loss of speed because of poor pickup by the pickup felt is a rare occurrence. It is interesting that 15 years ago the principal difficulty with pickup felts was from just this cause, but improved felt design and manufacture have corrected this.

Blistering seems to be a combination of too wet a felt and not too hot a dryer. The blistering itself is caused by either the wet sheet of the paper sticking to the pickup felt, or by water being evaporated by the heat of the dryer, causing a bubble or blister to form. This condition can be eliminated by using a more absorbent felt. Some mills believe a surface temperature above 200 degrees F. on the Yankee dryer will cause the sheet to blister off. The feeling was that if the sheet is not too wet, temperatures slightly above 200 degrees F. would not cause the sheet to blister.

Blistering or "flaring" at the edge of the dryer where the dryer is commonly hotter than anywhere else is sometimes corrected by the use of mist showers at the sheet and dryer edges.

The effects of poor drying would be the same as blistering, but across the entire width of the machine. This could be corrected by cleaning the pickup felt, or using a more absorbent felt.

Creping Problems Studied

Poor crepe is caused by the sheet not being dry enough, or not uniformly dry across the machine. This can be corrected by the same remedies indicated for poor drying. Drop-offs are caused by the pickup felt being too absorbent. The film of water holding the sheet of paper to the felt is lost, causing the sheet to fall off. This is corrected by installation of a harder felt.

Another mill superintendent asked, "Are more machines now using two pressure rolls on Yankee dryers?"

There are still very few machines using two rolls in this setup. It is obvious in these mills that higher speed is possible, but there seems to be a fear that one result would be too hard a sheet of paper.

In answering the question, "Do you believe in running your bottom felt tight (at, or beyond, the manufactured size)?," it was indicated more people than ever are running bottom felts at manufactured size (not necessarily the ordered size). This, it was emphasized, is an excellent idea from the standpoint of both the papermaker and the felt manufacturer. Operating size is thus more uniform from felt to felt, and openness and bulk are at designed specifications.

The importance of the relationship of size of the felt rolls to felt life was brought up by a mill operator from a northwestern state, and was answered in this way: "It is the consensus that the minimum diameter felt roll should be eight inches, and that ten inches would be safer. The diameter should depend on how tightly the felts are run and whether there is too much flexing in the roll."

The effect of felt density or bulk on sheet softness was answered by a northeastern mill superintendent who voiced the consensus opinion that the loss of felt bulk increases the hardness of the sheet. Density would be a factor in this only as it is related to bulk.

High Loading Effects

Another papermaker asked, "How are felts affected by high loading at the press and pressure roll?"

Albany technical men said higher nip pressure will give a harsher feel to the paper. On MG machines it has been found that a wetter sheet of paper and/or a wetter pickup felt will give a higher glaze at the dryer. It was further stated a lower nip loading would give the sheet higher tensile strength.

The problems relating to short reverse runs on the pickup were also discussed.

The general opinion was the only effect of using reversed runs on a top felt is that a longer felt is necessary. As long as there is no flexing of the felt rolls, it is thought the reverse runs would make no difference in the operation or in the life of the felt, although it is recognized it is harder to keep a film of water on the felt if these reverse runs are after the guard board on very high-speed machines.

Synthetic Content

The factors determining the distribution of synthetic yarns within the structure of pickup felts were next discussed.

S. Stuart Engle said, "Almost every new synthetic that has come on the market has been studied and tested in sample felts by our mechanical research department. Currently we are primarily using nylon or dacron as synthetics in our felts. The distribution of the synthetic between the warp and the filling yarns depends entirely upon the particular machine problems which indicate where synthetics would give the greatest benefits.

"For example, if the machine has a severe frictional wear condition we would use more synthetic in the filling yarns than in the warp yarns. If a pickup felt tended to crack in on the edges, an increase in synthetic in the warp yarn would be deemed advisable."

It was emphasized that Albany's belief is that a maximum of 25 per cent synthetic content in a felt under most conditions is as high as it is advisable to go. Over 25 per cent, it is thought that there is a loss in the operational characteristics of the felt, as well as in its stability. There are very few of our pickup felts which do not include some synthetic, and there are practically no Yankee bottom felts in which it is not used.

Current thinking on the use of chemical treatments was expressed by Mr. Engle who said, "It is our opinion chemical treatments should be used only on a basically good, felt design. When we have this basic good design, treatment can provide dividends in operating benefits. Among them are felts which remain soft and open, maintain size stability, resist bacteria and chemicals and provide longer life.

Singe and Pickup Ability

A tissue superintendent asked, "Does the degree of a singe on a

"How do felts limit speed by: poor pickup, blistering, poor drying, poor crepe and drop-offs?"

pickup affect its ability in picking up a short—versus a long—fibered stock?"

Albany Felt personnel said there did not appear to be any general opinion on this question. It was their thought the singe would not have too much of an effect either way. Practically all pickup felts have a hard singe.

Another mill manager pointed out almost everyone has to run hoses or fan showers on the edges of the bottom felt supposedly to keep the edges clean. He asked, "If stock causes filling up, where does it come from, and why?"

The stock is picked up from the wire outside the sheet area. The edge of the sheet on the wire is wetter than the sheet across the machine, thus causing crushing in the edge of the felt. Furthermore, where stock is washed off the wire, there are many fibers left which pick up on the pickup felt and are transferred to the wetter bottom felt edge. This can be corrected by running the edge of the bottom felt as dry as the rest of it, but it is more practical to use the shower or hoses on the edges.

Wahlstrom Theory

An explanation of the Wahlstrom theory of water removal from the press was asked by other mill personnel.

Albany's assistant chief chemist, John Sweet, said that although every papermaker is vitally concerned with the efficiency of water removal in the presses, the exact nature of the process has not been well understood, nor has the contribution made by the felt been entirely clear. In an effort to obtain a deeper insight into this problem, the research department at Albany Felt conducted a series of studies with the aid of an experimental press section designed and constructed especially for this purpose. These studies brought out the erroneousness of the widely accepted idea that more of the water is removed through action in which the felt expands coming out of the press nip and absorbs water, much like a sponge.

Instead, it was found the press action can best be considered as occurring in two stages. First, the paper and felt are entering the nip of the press. Water is squeezed out by the mechanical pressure applied. The felt plays a very important part in water removal at this stage by serving as a porous medium through which water can flow away.

In the second stage, which occurs as the paper and felts are leaving the nip, water is transferred from the coarser capillaries of the felt to the finer capillaries of the paper, according to well-established physical principles. In this stage, the felt plays a negative role, since it has the tendency to re-wet the sheet as it leaves the nip. A method was also developed for calculating factors which are measures of the performance of the felt in both stages of press action.

From these remarks, it will be apparent that both the felt and the paper machine itself must be designed so as to take full advantage of the drainage ability of the felt, while minimizing its tendency to re-wet the sheet as it leaves the nip.

Felt Cleaning and Conditioning

Other superintendents were interested in learning the best methods for keeping tissue machine felts clean through detergents, conditioners, and other basic activities.

James Garofalo said washing felts while making tissue and towel was virtually unheard of just a few years ago. Today, with the introduction of synthetic detergents, keeping felts clean and at peak efficiency while at the same time maintaining quality production, is a reality. Today's high speeds demand that attention be given to maximum operating conditioning for every felt. In many cases tissue mills have been obliged to remove a top or wet felt, not because it was worn out, but because it had become filled—an economic waste.

We know of one large Eastern tissue mill which was forced to shut down at least once a shift in order to clean their felts with a solvent in addition to resorting to wire brushing by hand to remove hard carbon-like deposits. At the mill's request, Albany Felt's special washing project team investigated. Findings indicated continuous washing would be beneficial. Various solutions of xylene, synthetic detergents and inhibited muriatic acid are now undergoing mill evaluation. Early results are extremely promising.

Asphalt adhering to the top and wet felts of a Midwestern tissue mill caused holes during runs of their napkin sheet. Experimenting on his own, the superintendent recently installed fan-type showers on the top and wet felt positions. Sulfamic acid and Triton X-100 are fed to these showers on a continuous basis by means of an acid proportioning pump.

The shower water is maintained at a pH of 4.5 which is also beneficial for wet strength runs. In fact, this particular combination allowed this mill to change from a wet strength to a regular run without shutting down for wash-up. Also, and even more significant, the felts became "conditioned," so the tendency for asphalt adhering to the felt was materially reduced. Although it is early for a true evaluation of this particular method of continuous felt cleaning, results are encouraging.

Types of Continuous Cleaning

Continuous felt cleaning may be further broken down into two categories; continuous and intermittent.

Continuous washing employs minute amounts of synthetic detergent proportioned into the shower lines. Generally, one to three pints of detergent in 50 gallons of water is metered at a rate which will allow this volume to be consumed in an eight-to-twelve-hour period. As a result of this application, the felt becomes "conditioned" so that it has less affinity for asphalt, inks, stock, and other foreign materials.

Intermittent, or "on-the-fly" felt washing employs relatively large volumes of dilute acid and detergent solutions (generally heated to 120 to 140 degrees F.) applied to the felt at regular intervals. This method of cleaning is ideal for washing felts subjected to wet strength resins. Usually a 100-200 gallon mixture of two per cent acid (inhibited, preferably) and ¼ per cent non-ionic detergent is applied through a perforated detergent shower pipe across the felt. The solution should be applied as soon as possible after the sheet leaves the felt. By so doing, the solution will have maximum time to "work" before it is removed by showers and suction boxes.

It is extremely important to begin cleaning early in the life of the felt. It is easier to keep a felt clean by early and periodic washings than it is to wait until the felt is heavily filled. Washing on a regular basis prevents paper fines and other foreign matter from becoming firmly embedded in the body of the fabric. More and more, papermakers are relying on chemical means to help them achieve this conditioning.

Garofalo emphasized that Albany Felt personnel are constantly studying felt conditioning methods to provide each papermaker with the maximum felt performance from every felt.

The enthusiastic response from tissue managers attending the session has resulted in planning for future round table meetings for these and other groups of paper manufacturers.

Prices of Fibers

MARKET WOOD PULP

FIRST QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'sn.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT
WEEK ENDED MARCH 20

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	n.a.	n.a.	n.a.	8.00/7.50
3	$7.00/6.50	$7.50/7.25	$7.50/7.00	7.25/6.75
4	6.50/5.75	6.50/6.25	6.50/6.25	6.50/6.25
5	5.75/5.25	5.75/5.50	6.00/5.50	5.75/5.50
6	5.25/4.25	5.00/4.75	5.25/5.00	4.50/4.25
7	4.25/3.75	4.25/4.00	4.75/4.00	n.a.

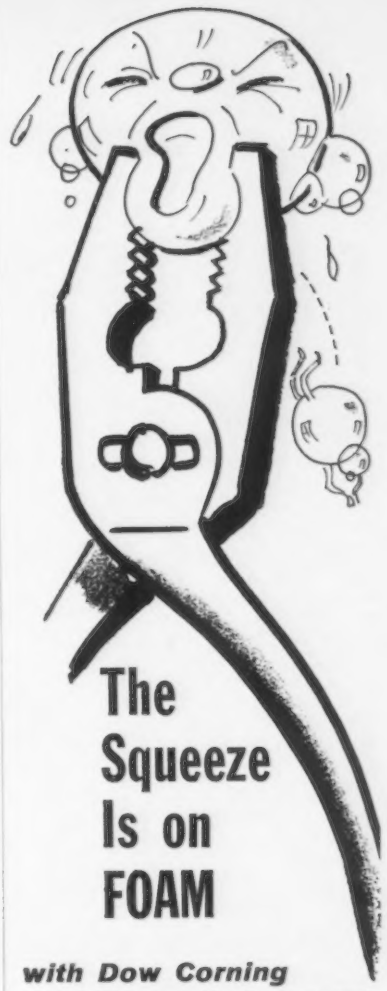
WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York	Boston	Chicago	Los Angeles
	March 27	March 27	March	March
No. 1 Mixed Paper	$ 7.00/ 9.00	4.00/ 7.00	6.00/ —	12.00/ —
No. 1 News	12.00/ 13.00	11.00/ —	11.00/ —	14.00/ —
Overissue News (Lg. size)	11.00/ 13.00	9.00/ 11.00	16.00/ —	13.00/ —
Mill Wrappers	19.00/ 22.00	9.00/ 11.00	9.00/ —	13.00/ —
Old Corrugated Containers	19.00/ 20.00	16.00/17.00	18.00/ —	17.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	28.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	27.50/ 30.00	30.00/ 32.50	30.00/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	45.00/ —	42.50/ —	— / —
New 100% Kraft Corr. Cuts	40.00/ 42.50	— / —	52.50/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 70.00	47.50/ —	45.00/ —
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	47.50/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	42.50/ —
No. 1 Groundwood Shvs.	25.00/ 30.00	20.00/ 25.00	10.00/ —	27.00/ 30.00
White Newsblanks	42.50/ 45.00	35.00/40.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	55.00/ 60.00	55.00/ 60.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	75.00/ 80.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	90.00/ 95.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	40.00/ 42.50	40.00/ 42.50	35.00/ —	35.00/ —
Manila Tab. Cards	57.50/ 60.00	55.00/ 60.00	55.00/ —	60.00/ —
No. 1 Col. Ledger	32.50/ 35.00	30.00/ 35.00	35.00/ —	18.00/ —
White Ledger	45.00/ 50.00	42.00/ 47.00	45.00/ —	40.00/ —
Mixed Book & Mag.†	— / —	— / —	8.00/ —	— / —
No. 1 Books‡	15.00/ 17.50	18.00/ 22.00	22.50/ —	8.00/ —

† Includes Time & Life: no coarse groundwood. ‡ Not to exceed 10% of groundwood.



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PJT NEWS OF SUPPLIERS

Ardelle Glaze

A. E. Reed

Tyler Wayne Research Corp., Cleveland, a newly announced company, has been formed jointly by The W. S. Tyler Co. of Cleveland, Ohio, and Fort Wayne Metals, Inc. of Fort Wayne, Ind.

Tyler Wayne will conduct research and development, hold patents, and provide licensing for a unique stainless steel wire process which has been developed by a joint effort of the two parent companies. One of the results of the research program was announced last month by The W. S. Tyler Co. with the introduction of its new Ty-Flex stainless steel wire cloth for fourdrinier paper making machines.

This development is expected to have great significance for the paper industry. Ty-Flex is the first successful use of stainless steel for fourdrinier application—and in extensive field tests has lasted from three to eight times longer than conventional wires. This added service not only reduces replacement costs of the wire itself, but avoids the tremendous costs—from 500 to 1000 dollars an hour—of shutting down fourdrinier machines for wire change.

The wire development of Tyler Wayne and used in the new Ty-Flex fourdrinier wire is unique in that it not only has the superior strength, and wear and corrosion resistance of stainless steel, but also has the flexibility and resistance to fatigue of non-ferrous metals.

Thus stainless steel wire made by the new process is expected to have wide application in other industries, particularly in the aircraft, missile, marine and industrial fields.

Ardelle Glaze, who is president of Fort Wayne Metals, Inc., has been elected president of the new company. Albert E. Reed, vice president-marketing of The W. S. Tyler Co., has been named secretary-treasurer. In addition to these two men, other directors of The Tyler Wayne Research Co.; and Frank D. Didier, vice president of Fort Wayne Metals, Inc.

S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N. Y., has appointed Oscar Kleinman chief engineer.

Mr. Kleinman joined S & S in 1946 and advanced to the post of sales liaison engineer, a position which enabled him to gain an intimate working knowledge of S & S corrugating, converting and finishing equipment, as well as the corrugated paper and box making industry. As chief engineer, he will be responsible for all activities of the engineering department and also will work with Albert Shields, vice president in charge of engineering, as chief assistant.

Oscar Kleinman

R. N. Wiewel

Stora Kopparberg Corp. has appointed Roger N. Wiewel district manager—pulp sales.

Mr. Wiewel will be responsible for sales of pulp in the Northeastern States from Stora's new pulp mill now being constructed by an affiliate, Nova Scotia Pulp, Ltd., on Cape Breton Island, Nova Scotia, as well as the well-known grades from Sweden.

For the past three years Mr. Wiewel has been manager, New England pulp sales, for The Weyerhaeuser Co. He joined its engineering department in 1952 and subsequently served as kraft mill shift superintendent at Longview before entering pulp sales. During World War II, Mr. Wiewel served in the United States Navy. He graduated from Carnegie Institute of Technology and Harvard School of Business Administration.

Rice Barton Corp., Worcester, Mass., has named W. Earnest Stone to the new position of manager of field service according to Charles S. Barton, president, and Frederick T. Coker, executive vice president.

Mr. Stone will supervise all machinery erection and customer in-

W. E. Stone

D. L. Boutin

stallations and will coordinate all activities between the field service and the Worcester plant. He has been with Rice Barton for 23 years as sales manager and sales engineer.

It was also announced that Delano L. Boutin, sales engineer for Rice Barton, has been assigned to the Savannah, Ga., sales office.

Mr. Boutin has been with Rice Barton for four years and has worked in the Worcester sales office in engineering, manufacturing and service.

De Laval Separator Co.'s Industrial Division has appointed Hugh J. McNelis a sales engineer in its Philadelphia office.

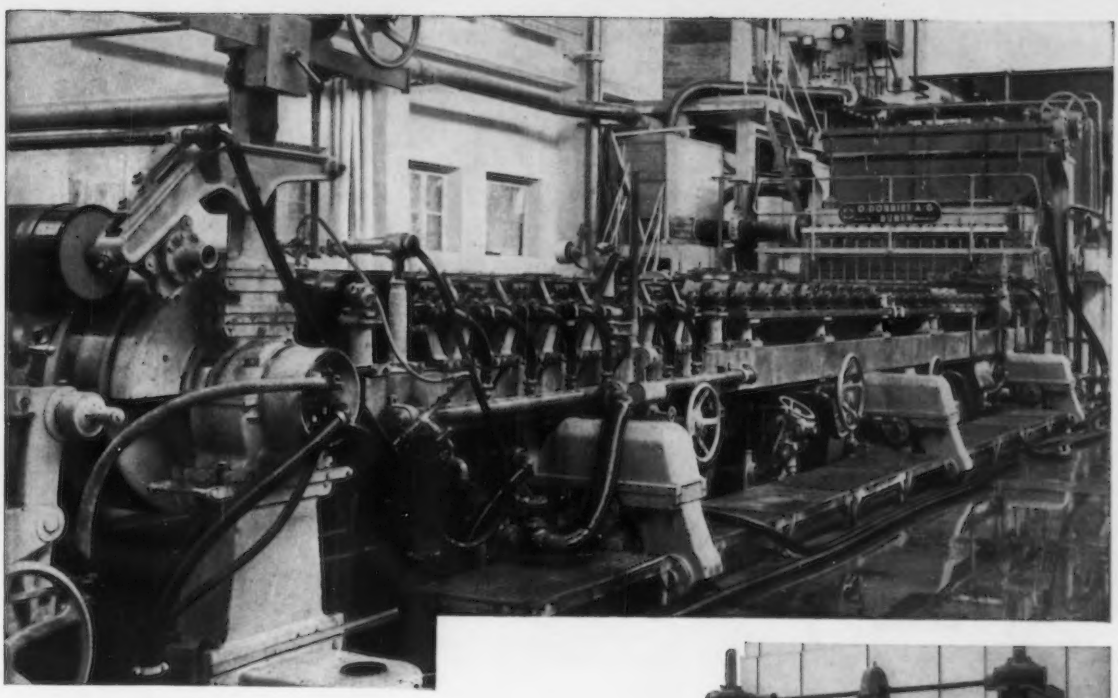
Mr. McNelis is a mechanical engineering graduate of Villanova College. Before joining De Laval, he was with Simplex Valve & Meter Co.

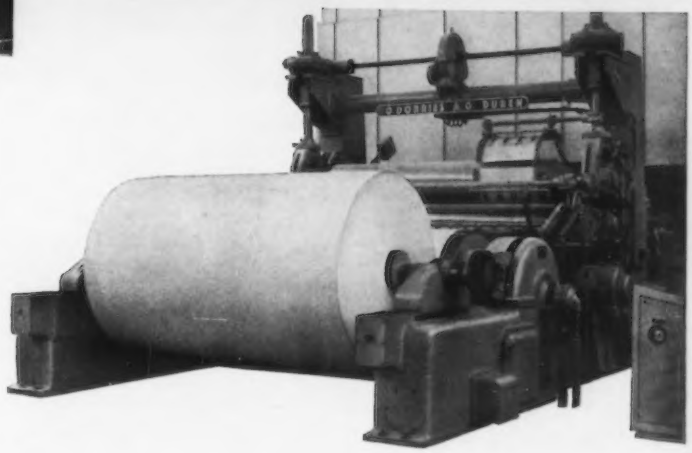
De Laval serves the processing industries with a broad range of plate heat exchangers and centrifugal separators.

General Dyestuff Co., a Division of General Aniline & Film Corp., New York, N. Y., has named Robert J. Holmes to the newly created position of acting product manager of the Blancophor product line (optical brighteners).

Until his current appointment, Mr. Holmes held the position of product engineer — surfactants and related chemicals department at Antara Chemicals, another division of the corporation. The Blancophor product line has recently been transfered from Antara to the General Dyestuff Co.'s Marketing Group.

Rader Pneumatics, Inc., engineering designers and manufacturers of pneumatic conveying systems for wood chips and other bulk materials, has named Edgar D. Hinton, who has





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been in industrial sales work in New England for the past 23 years, as its sales representative in New England.

Mr. Hinton is a graduate of Cooper Union Institute of Technology. His business address is P.O. box 164, Winchester, Mass.

W. R. Grace & Co., Overseas Chemical Division, announces the appointment of Edward F. Beyer, Jr., as a vice president.

Mr. Beyer will fill a new position which is the result of the expansion of the activities of the Overseas Chemical Division. Included in his duties will be the responsibility for liaison with the parent company, the domestic divisions of the Chemical Group, and the Overseas Chemical Division's headquarters in Cambridge, Mass. Mr. Beyer will be located at Grace headquarters in New York City.

Prior to this appointment Mr. Beyer served on the staff of the Grace Chemical Group in New York, which is the administrative center for Grace's eight chemical divisions.

Towmotor Corp., Cleveland, Ohio, has announced that preliminary plans have been completed with Lansing Bagnall, Ltd., of England for the manufacture of Towmotor products in England, with distribution throughout England, Continental Europe, and other foreign countries.

It was further announced that arrangements would be completed in the near future for the manufacture and distribution of Lansing Bagnall models of electrically powered fork lift and industrial trucks by Towmotor Corp. in the United States.

Lansing Bagnall is one of the largest European manufacturers of electrically powered fork lift and industrial trucks. Its products include a wide range of electric fork lift trucks, reach fork trucks, pallet, stillage and jack trucks, airport tractors and industrial tractors and trailers.

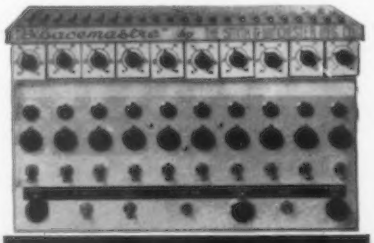
East Chicago Machine Tool Corp., East Chicago, Ind., announces the acquisition of the name "Balewell" and the manufacturing rights to the products of the Baler Corp., Lancaster, N. Y. The products consist of a full line of vertical type scrap baling presses including upstroke, downstroke and shredder type balers which will now be manufactured at the Balemaster Division plant of this East Chicago firm. The operating personnel of Balemaster will handle the Balewell line in addition to its line of horizontal cyclomatic scrap handling and baling systems.

Hercules Powder Co.'s newly completed and fully integrated multimillion dollar facilities at Hercules, Calif., establishes the company as the only one on the West Coast that produces methanol, formaldehyde, and urea.

The initial three products are designed for the economical manufacture of many types of urea-formaldehyde resins for a variety of industries on the West Coast including plywood, adhesives, furniture, paper, particle board, etc.

Sold by the Synthetics department of Hercules, the three products are identified as UFC 7626, UFC 7147 and UFC 8545. The products differ in the content of formaldehyde and urea and solids content. Every step of their manufacture, from piping in natural gas to shipping of the finished product, is carried out at the new facilities in specially designed control-sensitive equipment.

The newly completed facilities provide for the production of 11,000 tons of urea-formaldehyde compositions annually as well as for 8,000,000 gallons of methanol and 50 million pounds of formaldehyde annually. Sufficient capacity has been installed to permit quantity sales of methanol and formaldehyde.



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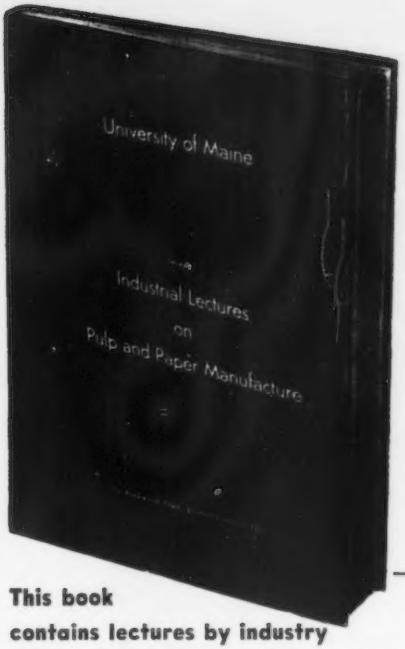

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PULP SECTION

The Structure of Wood
Chemistry of Cellulose and Wood
The Wood Supply
Preparation of Wood
The Wood Room
Manufacture of Groundwood
Mechanical Pulping
Grinders and Grinding
Cooking Acid Preparation in the Sulfite Process
Sulfite Pulping Sulfur Dioxide Preparation
Sulfite Acid Preparation
Sulphite Pulp Acid Making Systems
Cooking Sulphite Pulp
Sulfite Pulping
Neutral Sulfite Semi-Chemical Pulping
Soda Pulping
Kraft Pulping
Sulphate Recovery Units
Chemical Recovery Unit
Peroxides
Peroxide Bleaching
Chlorine Bleaching
Corrosion-Resistant Metals for Pulp and Paper Industry
Application of Chemical Engineering To Pulp and Paper Technology

PAPER SECTION

Waste Paper, Its Collection and Usage
Facts Concerning the Waste Paper Industry and its Relationship to Pulp in the Paper and Paperboard Industries
Beating and Refining
Stock Preparation
Fillers and Loading
Paper Fillers
Starch Sizing of Paper
The Dyeing of Paper
Coarse Papers Bag and Board
Coarse Papers
Sanitary Tissues
Instrument Applications in Pulp and Paper Mills
Fourdrinier Paper Machines—Wet End
Paper Machines—Wet End
Fourdrinier Paper Machines—Dry End
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Drying Theory and Practice
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The *University of Maine Lectures,* Series II, Contains 373 pages of up-to-date material covering a broad field in both pulp and paper making and including many fine illustrations and diagrams. The book was edited by Professors Lyle C. Jenness and John Lewis of the University of Maine. This cloth-bound book originally sold for $7.50.

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Securing round-the-clock operation from 2300 motors at the Riegel Paper Corporation plants in Delaware Valley puts a great burden on electrical maintenance. Part of the credit for outstanding trouble-free operation goes to the use of MULTI-AMP portable high-current test units for delay checking on the 33,000-volt system and all component circuits.

The MULTI-AMP is on constant call for checking series tripping systems and motor over-current protective relays. An electronic stop timer simplifies its use and renders trip-time calibration even more accurate.

Advantages of the MULTI-AMP unit include: dependable primary current flow accurately adjustable in stepless increments without fluctuation; light weight, portability and simplicity.

For more information about Riegel's electrical maintenance program read Volume 1, No. 5 of our publication, The Electrical Tester.

M 103

Free copy on request. Call or write MULTI-AMP Division, MULTI-AMP ELECTRONIC CORP., 465 E Lehigh Avenue, Union, N. J. — MU 8-7112

PJT + NEW LITERATURE

Circular Prestressed Concrete Tanks

Contains engineering and construction data on the basic tank elements such as the floor, base, walls and the dome or roof. The use of these tanks for water, petroleum products, chemical and liquid gas storage is discussed. There is a section on the economic advantage of prestressed concrete tanks and a new tank capacity chart. Bulletin. The Preload Co., Inc., 355 Lexington Ave., New York 17, N. Y.

Hodag Surface Active Chemicals

Acquaints chemical users with the products and the services of Hodag Chemical Corp. Hodags antifoam agents, emulsifiers and other surface active chemicals find wide application as additives and raw materials among manufacturers and processors in the pulp and paper, food, pharmaceutical, cosmetic, paint, adhesive, fermentation and chemical processing industries. Brochure. Hodag Chemical Corp., 7247 North Central Park, Skokie, Ill.

Ross-Waldron Equipment for the Paper Industry

Includes pictures and information on Ross air processing equipment, Waldron web processing machinery and the Ross-Waldron coordinated equipment and research facilities. The Air Blade Coater line operates in the dark, it is used to apply photographic emulsions to paper 43 inches wide at speeds up to 200 feet per minute. Ross-Hooper Hood assures efficient and economical drying by exact moisture exhaust. Bulletin RW-600. Waldron-Hartig Division Midland-Ross Corp., P. O. Box 791, New Brunswick, N. J.

S-W Suction Rolls for Papermaking

Gives information about suction press roll coverings. In addition to providing technical information about S-W suction roll covers, the literature claims that improved bonding methods have been developed through the years to cope with changing conditions in papermaking. Bulletin. Stowe-Woodward, Inc., Newton Upper Falls, Mass.

Staley Automatic Jet Cooking System

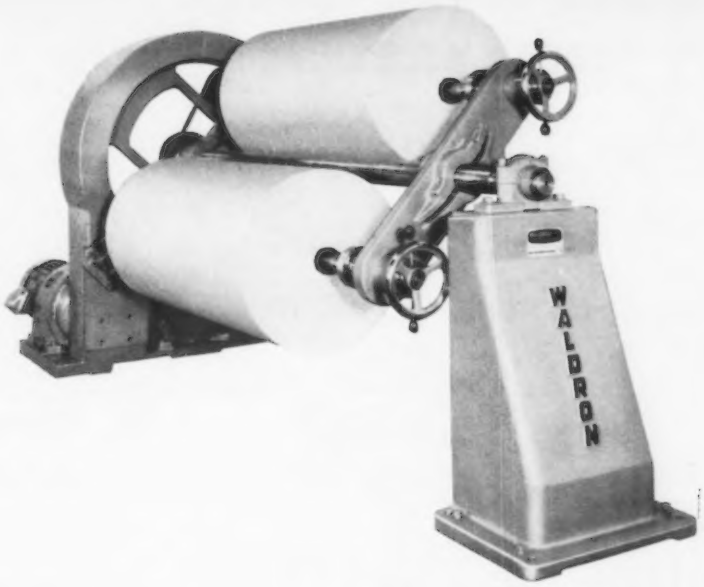
Describes the latest applications of this system which does away with batch starch cooking difficulties, and automatically provides a continuous flow of starch paste with consistently uniform concentration, cooked properties, temperature and viscosity. The system is adaptable for either bagged or bulk starch. It is tailored to exact needs and scaled to the specific requirements of the plant for which it is built. Brochure. A. E. Staley Manufacturing Co., Decatur, Ill.

Revised Edition of Brusewitz Directory Ready

Brusewitz Paper and Pulp Makers Directory of Sweden, Norway, Denmark and Finland, which is published every other year, is now ready in a new revised and up-to-date edition. The book is divided into four general sections: the first, General Trade Rules, presents details on the conditions and guarantees as agreed upon by the various firms in the Scandinavian paper and pulp industry; the directory section lists the Scandinavian mills and gives the latest data and details of the management, capital, annual production, machinery, and other important items; the Classified Index lists the companies according to the products they manufacture; Trade Marks of most of the firms are listed in the last section of the Brusewitz Paper and Pulp Makers Directory.

A separate map, in color, about 28 x 30 inches is included with every directory. This map gives the geographical location of the various mills, their production, nearest shipping ports and communication centers. The map is also available separately at a price of five Swedish kroners.

With this 1960-61 edition, the 23rd, Wezäta Förlag AB assumes the publication of the Directory from its affiliated company Hugo Brusewitz AB. The book may be ordered from Wezäta Förlag AB, P.O. Box 5057, Göteborg 5, Sweden. Price: 35 Swedish kroners, or equivalent currency (about $6.78 U. S.). 356 pp.



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Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures
(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Feb. 18	Feb. 25	Mar. 4	Mar. 11	Mar. 18
1961	88.5	88.0	90.6r	91.9r	91.1
	Feb. 20	Feb. 27	Mar. 5	Mar. 12	Mar. 19
1960	98.5	96.5	97.1	97.6	98.7

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0‡											

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	94.1	95.9	100.8	96.0	88.1	90.1	97.3	89.5
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.8	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Feb. 18	Feb. 25	Mar. 4	Mar. 11	Mar. 18
1961	87	89	89	93	91
	Feb. 20	Feb. 27	Mar. 5	Mar. 12	Mar. 19
1960	96	91	94	94	94

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	88	89											

‡ Preliminary.
† *Per cents of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	WEEK ENDING March 11, 1961	WEEK ENDING March 18, 1961	CUMULATIVE TO DATE Jan. 1, 1961, to March 18, 1961
% Activity	93%	91%	89%
Total	323,093	320,783	3,283,799
Containerboard—Domestic Use	154,396	166,100	1,658,010
Liner	101,425	112,084	1,101,680
Corrugating Material	47,262	48,047	505,395
Chip & Filler Board	5,709	5,969	50,935
Boxboard—Domestic Use	98,859	99,725	1,037,161
Folding	58,174	58,459	613,500
Set-Up	10,964	9,814	100,929
Special Food Board	29,721	31,452	322,732
Other Paperboard	69,838	54,958	588,628
Containerboard Type	37,719	25,773	280,965
Boxboard Type	32,119	29,185	307,663
Total Orders			
Received	327,851	304,551	
Unfilled End of Week	448,677	434,750	

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PROJECT ENGINEER

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An excellent opportunity for young men having 3-5 years' experience in the paper machine, or some related industry. Manchester, manufacturers of complete paper machines of the fourdrinier and cylinder types as well as component parts, is expanding rapidly and needs your assistance to continue its growth. Job advancement, salary, and fringe benefits make these positions well worth exploring. Send resumes to:

The Manchester Machine Company

Personnel Department

P. O. Box 509

Middletown, Ohio

A-3

ASSISTANT SUPERINTENDENT FOR TISSUE PAPER MACHINE

We want an aggressive man who will assist his superintendent in improving the general efficiency and reliability of his entire department also sharing in the responsibility with his superintendent for a new, modern, large, high-speed tissue machine currently recognized for quality production. This is a challenging opportunity in an aggressive, fast-growing organization for a person with an engineering or technical background with supervisory experience in tissue paper manufacturing. Southern location. Salary commensurate with experience and ability. Send complete resume to Box 61-58 care Paper Trade Journal. A-17

Help Wanted

MALE OR FEMALE EDITORIAL ASSISTANT

Building Materials Company in the New Orleans area is seeking a college graduate in journalism with three years experience in copywriting, publication lay-out, editing and news gathering in connection with Company publications, bulletins and news releases. Individuals having related experience in the journalism field will be considered for this position. State salary requirements. Box 61-65 care Paper Trade Journal.

A-3

PAPERCONSULT AKTIENGESELLSCHAFT

Ingenieurbureau für die Beratung der Zellulose- und Papierindustrie, eine Tochtergesellschaft der international tätigen Sandwell-Organisation Vancouver/Kanada, sucht für ihre Büros in Zürich, Schweiz, gut ausgewiesene

INGENIEURE TECHNIKER ZEICHNER

mit Erfahrung in der Zellulose- und Papierindustrie.

Geboten werden: vielseitig hochinteressante Arbeit, gut bezahlte Dauerstellen mit Personalversicherung, Fünftagewoche und englische Arbeitszeit.

Offerten mit Lebenslauf, Photo und Zeugnissen sind erbeten an:

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Postfach Zürich 22

A-3

WANTED—Paper mill desires experienced tour boss with background in specialties and saturating papers. If interested send complete background details and recent photograph to Box 61-55, care Paper Trade Journal.

A-10

MULTIWALL SUPERVISOR

Must be thoroughly familiar with all phases of multiwall operation—setup, running, also tape bottoming and sleeving and valving. Give all particulars of experience and types of machines, also salary desired. Box 61-57 Paper Trade Journal. A-3

Situations Wanted

***Production executive* — conversion of boards, paper & film. Well versed in heading up all production functions in an organization; or reorganization deal. Multiple manufacturing units. Employed — wishes change for challenging opportunity. Box No. 61-9 care Paper Trade Journal.**

A-24

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5270 E. Wash. Blvd., Los Angeles 22, Calif.

PRINTING PRESSES

1—24" 5-color Kidder Celloprinter
1—24" 4-color Kohlbach Flexo Press with Stanford Web Guide and Tension Controls
1—26" 3-color gravure press
1—30" 6-color Kidder celloprinter
1—32" 4-color Potdevin flexo tailprinter
1—33" 6-color Modern Clipper Flexo Press
1—33" 4-color Wolverine Hydro-Printer
1—34" 4 Color Wolverine—Poly Press
1—36" 6-color Cottrell Heinrich Flexo Press
1—40" 4-color W & H Flexo Press
1—41⅜" 5-color Staude Roto Gravure Press
1—42" 4-color Crawford Flexo Press
1—42" 4-color Hudson Sharp Flexo Press
1—48" 6-color Heinrich 4 Flexo 2 Gravure
1—50" 3-color Custom made flexo press
1—51" 3-color Flexo Press

CAMACHINES

1—162" Type 10 Model 19 Shear Cut
1—102" #18
1—87" Type 12
1—72" Type 10 6A Anti Friction Bearings
1—72" 10-10A
1—62" 10-11A
1—62"—50"—42" type 6
1—52", 10 5-A
1—62"—42"—32" 26-3A Duplex
1—52" 24-7 Duplex
1—50" 28-3D Duplex

OTHER SLITTERS

1—102" Langston, 60" Rewind Capacity
1—82" & 1—92" "BA" Langstons
1—40" & 1—52" Fales Model "B"
1—52" Moisel (Shear-Cut)
2—40" Beck Razor Blade Slitters
1—40" & 1—60" Kidder SH 40" rewind
1—24" 1—30", 1—36" & 1—40" Kidder S.L. & 1—36" SLN

POWER PAPER CUTTERS

SEYBOLDS:	64" precision	
	56"-Dayton	44"-Dexter
	50"-Precision	44"-C&P
		44"-Oswego
	44"-Mod. "CF"	44"-10Z
75"-Oswego	40"-Mod. "CF"	38"-Oswego
	50"-C&P	32"-Oswego
57"-Oswego	50"-Dexter	32"-3Y

MISCELLANEOUS MACHINES

1—166" Clark-Aiken Duplex Sheeter w/layboy
1—90" M&W Sheeter O/lapping del. & Layboy
5—Hamblets 100-72-64-60" w/layboy
1—84" Hamblet Duplex Heavy Board Sheeter
1—78" M&W Sheeter & Layboy
2—Becks—45 CSH—55 CCSH
1—Hansel Bag Machine—3 color printer
1—Simplex 7-24 Pouch Machine, E/eye
1—Multipath Bag Machine — 4 Color Holweg Printer
1—Strachan & Henshaw Bag Machine—2-color Aniline Printer
1—Model 4 Potdevin Sack Machine
2—38" x 24" 4-Post Seybold Die Presses
3—Sheridans 50 x 24 44 x 20 36 x 18
Embossers 48" 55" Waldron & 50" Heavy Duty Hudson Sharp Tinter-Embosser
1—34" Waxer with 4-Ton Refriq. Unit
1—40" International Paper Box Machine Co's Sheet-Fed Carton Waxer
1—60" Perkins Squeeze roll waxer

A-3

ROSS PAPER MACHINERY CO.

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BAG MACHINERY
1—S&H 3½" to 10¼" face, 6" to 13" Tube Pull
1—G&H 3 ply Tuber—SOM—Flat or Gusseted Bags; tube length 9" to 35"

BEATERS
2—3000# Downingtown 60" x 67" roll; like new
1—1500# Dilts Breaker Beater; roll 54" x 64" w/75 h.p. motor

CALENDER STACKS
1— 80" P & J 7 roll; heavy duty
2— 82" & 86" Lobdell five roll
1— 96" B-C 6 Roll—heavy duty
1—104" B-C 8 roll
1—115" B-C 7 roll
1—124" Downingtown 5 roll
1—124" Downingtown 6 roll
1—126" Farrell 9 roll—w.c. bearings

CHIPPERS
1— 96" Murray 6 knife; A-F Brng

COATERS
1— 24" Waldron Coater & Embosser
1— 60" Egan Air Knife—New 1956
2— 65" & 76" Mayers

COMPLETE PAPER & BOARD MACHINES
3—Sandy Hill 81" trim single cyl. Tissue
1—M & W 72" Trim Fourdrinier paper machine
1—B-C 100" 7 cyl. Board Machine Complete
1—M & W 72" Trim Yankee Fourdrinier
1—Rice Barton 84" Fourdrinier

CYLINDER MOLDS
1—104" face x 36" dia
8—114" face x 36" dia. w/rubber couches
8—124" face x 36" dia w/rubber couches

CYLINDER WET ENDS
1—Single cylinder; 99" face x 48" dia.
1—114" 7 cyl. Wet End, complete through main presses
1—124" 7 cyl. Wet End, complete through main presses

DRYERS—HYDROSTATICALLY TESTED
24" Dia.:
37—46" face; Chrome plated
1—156" face w/gear and steam joint

28" Dia.:
3— 70" face w/gears & bearings
3— 73" face w/gears & bearings
3— 76" face w/gears & bearings
3— 77" face w/gears & bearings
2— 84" face
2— 84" face w/accessories

36" Dia.:
1— 42" face
2— 44" face; 2—46" face
3— 70" face w/gears & bearings
11— 72" face w/gears & bearings
1— 74" face Lukenweld w/A-F Brng
8— 75" face w/gears & bearings
26— 76" face; complete section
9— 76" face w/gears & bearings
2— 77" face w/gears & bearings
1— 78" face w/gears & bearings
2— 80" face
5— 84" face
11— 84" face; complete section
18— 90" face; complete section
9— 92" face; complete section
1— 96" face
1—138" face
10—160" face

42" Dia.:
23— 73; 74; 76" face; complete section
46— 96" face w/gears, frames & bearings
1—120" face
1—160" face

48" Dia.:
49— 46" face; chrome plated
12— 82" face; complete section
3— 84" face
21—106" face w/gears & bearings
2—110" face w/gears & bearings
10—123" face w/gears, frames & bearings
1—128" face

DRIVES—ENCLOSED RIGHT ANGLE
1—Beloit 65 h.p. Ratio 2.88 to 1
3—Jones 65 h.p. Ratio 4.83 to 1
1—Michigan 92½ h.p. ratio 10.1 to 1
1—Phila. 28 h.p. Ratio 10.56 to 1
1—50 h.p. Reliance VS with MG set & controls
1—Cleveland 47 h.p.—ratio 3 5/9 to 1
1—Cleveland 23.5 h.p.—ratio 3 5/9 to 1
2—Falk 50 h.p. Ratio 3.529-1
3—Beloit 75 h.p. Ratio 3, 4 & 4.6875 to 1

EMBOSSERS
1— 80" Hudson Sharp; A-F Brng
2— 62" Textile Machinery Co., w/drives

EXTRACTORS ROLLS—DOWNINGTOWN
1—128" face x 24" dia.—complete section

FELT CONDITIONERS—VICKERY
1—New Bird—218" Max. cleaning area
1—New Bird—166" Max. cleaning area

FLAT SCREENS
2— 12 plate IMPCO w/Dunbar Drives
8— 14 plate IMPCO—Bronze Vats S.S. Plates

"HYDRAPULPER"
1—Dilts 16 ft. Batch type complete w/125 h.p. motor—CI Sectional Tub

INLETS & HEADBOXES
1—106" Valley w/8" distributing roll
1—131" Valley w/10" distributing roll; SS lined
1—131" Beloit Pressure Type; SS rolls—1100 f.p.m. S. S. Construction

JORDANS
2—Appleton #1 w/A-F Brng
1—Horne w/A-F Brngs
4—Shartle Miami #2 w/A-F Brngs
1—Jones Midget—Used 2 months
1—E. D. Jones #4 Imperial PMN. A.F. Brng.

MOTORS 3 PH 60 CYCLE
1—100 h.p. GE; 440 v; 695 r.p.m.
1—300 h.p. West; 2200 v; 503 r.p.m.
1—350 h.p. GE; 2200 v; 720 r.p.m.: Synch

PAPER MACHINE DRIVES
1—De Laval 100 h.p. steam turbine w/reducers

PULP MILL EQUIPMENT
1—Lannoye #1 Pulper
1—Murray 2 deck Chip Screen, 5 ft x 14 ft.

PUMPS—OPEN IMPELLER
47—Centrifugal Stock and Water Pumps
1—Shartle 7 x 16 Triplex
1—Shartle 8 x 18 Duplex

REELS
1—100" Kohler automatic two arm unwind reel; 60" dia rolls; new condition
1—109" two bowl upright
1—123" Beloit—2 bowl
1—126" Beloit Aldrich surface drive type
1—146" B & S pope type w/Reliance drive

REFINERS
1—Jones Fibremaster — SS Filling—200 h.p. motor & controls
2—#1 Claffin; A-F Brng
1—24" Downingtown Weiner; new
1—36" Bauer, Model 185 w/2—75 h.p. motors
1—Dilts #4 Hydrafiner—AF Brng.
1—Dilts 36" Classifiners AF Brng
2—#4 Shartle Cyclifiner PMN A.F. Brng.

ROLL GRINDERS
1—124" x 30" Farrel w/crowning device
1—208" x 32" Farrel w/crowning device

ROLLS
Distributor—Stainless Steel
2— 8" dia x 115" face
1— 6½" dia x 115" face
Couch—Rubber Covered
20 Misc. Sizes Dwngs Available
Press—Rubber or Brass Covered
71 Miscellaneous sizes. Drawings available
Felt—Steel, Brass, Rubber Covered
335 Miscellaneous sizes. Drawings available
Calender—Chilled Iron
72 Miscellaneous sizes. Drawings available

ROTARY SCREENS
5—Bird #3A, Model 100 w/copper vats
1—Jones Leithwalk copper lined

SHEETERS—WITH BACKSTANDS
1— 45" Beck w/Jogger
1—45" Hamblet w/M&W Layboy
1— 50" Finley
6— 56", 60", 66" & 70" Hamblets
1— 65" Kidder w/elec. eye and layboy
3—72" Hamblet w/M&W Layboy
1— 76" Beloit Duplex
1— 82" Hamblet
2—82" Hamblet w/overlapping M&W Layboy
1— 85" Hamblet duplex w/layboy
1—105" Hamblet
1—112" Beloit Duplex Board Cutter; A-F Brng

SLITTERS & REWINDERS
17¾" Maximum Rewind Diameter
2— 42" Cameron Type 26-2A
24" Maximum Rewind Diameter
2— 42" Cameron Type 6
1— 42" Cameron Type 6 Shear Cut
1— 62" Cameron Type 6
1— 72" Cameron Type 9-S
30" Maximum Rewind Diameter
1— 60" Langston Shear Cut
1— 72" Cameron Type 10; A-F Brng
1— 72" Cameron Type 10 Shear Cut; A-F
36" Maximum Rewind Diameter
1— 70" Variable Speed Center Winder
1— 62" Cameron 8-10
1— 72" Cameron Model 8-10
1— 82" Cameron 10-11; A-F Brng
42" Maximum Rewind Diameter
1— 40" Egan Shear Cut; A-F Brng
1— 60" Kidder Model SH Low Bed
1— 72" Beloit Shear Cut
1—136" Cameron Type 18; A-F Brng
1—161" Cameron Type 18 w/60 h.p. Reliance VS Drive
48" Maximum Rewind Diameter
1— 86" M & W Four Drum Shear Cut
1—152" Langston Shear Cut
60" Maximum Rewind Diameter
1—112" Cameron Type 18
1—120" M & W two drum w/75 h.p. drive
1—120" Langston
1—136" Langston; AF Brng; shear cut

SLITTERS & REWINDERS—DOUBLE REWIND
18" Maximum Rewind Diameter
1—42" Cameron 26-7D for Cellophane
30" Maximum Rewind Diameter
1—42" Essex Shear Cut; A-F Brng

STOCK CLEANERS
2—1000 g.p.m. Shartle Hydrafuges w/motors
14—Bird Dirtecs; 2" & 6" bronze
1—Bird Dirtec 12". Rebuilt by Bird
21—4" Vortraps—Bronze

STOCK REGULATORS
2—Braemer SS; 25 t/d cap; Foxboro controls
2—Poirier; 25T/D cap

SUCTION COUCH ROLLS
1—125" face x 18" dia—bronze brng
1—144" face x 30" dia—roller brng

SUCTION EXTRACTOR ROLLS—DOWNINGTOWN
1—105" face x 19" dia
1—126" face x 22" dia; complete section
1—134" face x 18" dia.; A-F Brng

SUCTION PRESS SECTIONS
1—114" face x 20¼" dia. R. C. Complete section
1—120" face x 18" dia—R.C.—Roller brng
1—126" face x 24" dia. R.C.; A-F Brngs; new 1951

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